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The Harney Peak Tin Mining Company of South Dakota is at last offering some ore for sale from the property. It is not tin ore, however, the hope of finding which in paying quantities, at least, was given up long ago. The presence of some deposits of spodumene on the property was ascertained some time ago, and the receiver now offers for sale a small quantity of that mineral which is at present in some demand for its lithia contents. It is not probable that the spodumene will make up for the absence of the tin-ore which was expected to make the property so valuable some years ago, but it is at least evidence that something marketable exists there.

An evident disposition exists in the West to introduce improvements in the coal mines as well as in other mines, and especially to provide for a local supply of proper fuel for the smelters and other metallurgical establishments. The high cost of transportation has always made coke an expensive fuel, and to this is now added the high price of the fuel in the East and the difficulty of securing sufficient supplies promptly. An instance of this tendency is found in the establishment of a large coal-washing plant, at the belt mines in Montana, which are owned by the Anaconda Copper Company. The advantages of washing coal before coking it have been sufficiently established. The putting of the coal into better shape for the coke ovens, and freeing it to a great extent from sulphur and other impurities which detract from its value, have been shown to pay well where it has been done. In the South, especially in Alabama, a very large proportion of the coal is now washed—including nearly all that which is to be made into coke—and the process is accepted as a necessary operation in coke making, and to a considerable extent also in preparing coal for the market. Its extension still further would probably prove very beneficial to the coal mines of the Northwest.

The general activity in business and the resulting strong demand and high prices paid for copper have stimulated copper mining everywhere. Among other places the Vermont copper belt has felt the influence of the boom. We have heretofore referred to the work which has been carried on for some time past in the Elizabeth Mine at South Strafford, in Orange County, which has resulted in developing a large body of ore. It is now understood that the Ely Mine at Copperfield has been sold to a party, at the head of which is Mr. George Westinghouse; of Pittsburg, and that the new owners intend to work the mine on a large scale. A good deal of work has been done on this mine in times past with good results, and it is believed that it can be made as good a property as the Elizabeth. The importance to such large consumers of copper as the Westinghouse group of companies of controlling their own supplies of the metal will be readily understood, and there is no doubt that the mine will be worked in the best manner, when the new owners take charge.

There are other valuable deposits of ore on the copper belt of Orange County, which will probably be developed in due time, and this change at the Ely will help to draw to these mines some of the attention which they ought to receive. At the Milan Mine in New Hampshire, also, work now in progress has opened a fine body of ore.

The French Societe des Metaux is an organization which seems to be particularly unfortunate when it undertakes to deal in speculative values. Most of our readers will remember the part which the company played in the great Secretan corner and the collapse which followed. After the crash, the company was reorganized, and has since been doing a steady and somewhat profitable business, as a dealer in metals. Last spring, however, the president and secretary of the company undertook an operation in copper of considerable proportions on the assumption that lower prices for the metal were probable. What the course of quotations has been, our readers know, and this operation for the fall resulted disastrously. The president and the secretary were forced to resign some time ago, by the directors, but the full extent of the loss was not known until the publication recently of the company's report for the year ending June 30th, 1899. From this, it appears that during that year, the company paid ut on account of this unfortunate operation, 898,000 francs; while there still remained 206,000 francs to be paid out on the current year's account. The total loss has been 1,104,000 francs, and this has wiped out almost entirely the profits on the company's other business for last year. The directors have instituted suits against the late president and secretary on the ground that they acted in the matter without proper authority. Apparently, however, they do not expect to recover the money lost, and it has been charged off on the company's accounts.

It is stated that coke is now actually being made from Utah coal. It appears that some coal from Iron County, Utah, was recently sent to County coal can be converted into coke, the supply of fuel will be making coke, which has been lately devised, and which is controlled by the Leiters of that city, who have put up an experimental plant. A

lot of coke made from this coal was received recently in Salt Lake City, and a test of its quality was made in the presence of a number of mining men interested. The test was made in a cupola in the Silver Brothers' foundry, and was entirely successful, the coke being pronounced as good as Connellsville, and excellently adapted for use in the furnace. It is very compact, somewhat heavier than the coke commonly shipped to the West, while analysis showed it to be free from sulphur. Should this experiment be followed up by others equally successful, it will be of considerable importance to Utah. It will mean not only a local supply of coke for the smelters, but very probably also the development of an iron industry in the State. There are known to be considerable bodies of iron ore in Southern Utah, and if the Iron County coal can be converted into coke, the supply of fuel will be near at hand. The probable establishment of iron works would doubtless induce the construction of the projected railroad line into Southern Utah, for which surveys were made some years ago. With fuel and transportation, there is little doubt that the iron ores can and will be utilized before long.

The high prices of tin which have prevailed during the latter half of the present year are producing their natural effect, and we hear of the prospective or actual opening of new tin mines in various parts of the world. In the Malay Peninsula, the number of Chinese miners and prospectors is increasing, and new ground is gradually being opened. Although the slow methods of the region make some length of time necessary, for the usual preliminary work, there is no doubt that the production of Straits tin will before long show a considerable increase. In the Dutch East Indies, especially in the Billiton and Singkep mines extensions are also being made, and next year's production will probably be larger than ever before. In Australia and Tasmania, prospecting for tin has been very active, and although new properties are not being added very rapidly to the producing list, there is still some prospect of a future increase. The most notable new mine is the Briseis in Tasmania, to which our London correspondent refers on another page, and which appears to have considerable promise, although it still is in the preliminary stage. Upon the whole, we may expect an increase in the world's supply of tin during the course of next year, which may attain considerable proportions.

Meantime, the speculation in the metal appears to have passed its height, and there has been a marked reaction in prices, although they are still far above the level of last year.

THE METRIC SYSTEM.

Congress will be fairly busy at the present session with financial legislation and measures for the government of our new territories; but there ought to be time to consider the bill to establish the metric standards for all Government work, and there will be if it is properly pressed. The subject has been well debated heretofore, the advantages of the proposed change are appreciated, and there is really very little to be said. The nature of the opposition to it is well understood. Its strength lies chiefly in a stubborn conservatism and the old-fashioned feeling that anything foreign must be inferior to our own; while this is supported in some quarters by an exaggerated idea of the difficulty and cost of the change. Many of our more progressive and enlightened manufacturers are already prepared for it, and some, who have entered extensively into foreign trade, would welcome it as relieving them from the necessity of keeping double standards and double sets of measures and weights. Even the Philadelphia manufacturers who have been so bitterly opposed to the metric system are beginning to see some light and to admit that something is to be said for the system.

The fact that our foreign trade is extending so largely has much to do with the appreciation of the fact that the use of the metric system is desirable; and the opportunities of practical familiarity with it which that trade has afforded have been of considerable service in the same direction. In legislating for our new possessions, it must not be forgotten that Cuba and Porto Rico already use metric measures, and it would be a great pity to attempt to bring them backward to our own absurd system.

The legislation desired is exceedingly simple. As is well known, the use of the metric system is already authorized by law; and all that is now asked is the passage of a brief act requiring its use in all transactions with and by the Government, after a fixed date—January 1st, 1901, the opening of the new century, would be a good starting point. The use of the system in Government reports and transactions would be quickly followed—perhaps preceded—by its adoption in general use. As we have often said, we believe that the difficulties attending a change have been very much exaggerated. A decimal system, in which the relations of the measures of length, size and weight to each other are simple and easily understood, is readily mastered, and the new names quickly learned. In a few years, we believe, it will be so firmly established that we will wonder why we consented so long to continue the use of our old system, or rather jumble, of weights and measures.

THE WAR IN SOUTH AFRICA.

Accounts from the Transvaal mines are both limited and unsatisfactory. Mail and telegraphic communication is entirely cut off and the only news which can be obtained from South Africa relates to the military operations. The activity of these and the varying fortunes of the conflict seem to indicate a long period of idleness for the mines. It is known that most of them are practically deserted, nearly all the white employees and the negro laborers having left the Witwatersrand, while very few of the managers remained or were allowed to remain. No actual damage has been done to the majority of the mines and mills, but their condition, left without supervision, and with very little care, will be undoubtedly poor when it is possible to begin work again.

A private letter sent through the lines and mailed from a point in Cape Colony gives some idea as to the condition of affairs soon after the breaking out of the war. The Government promptly seized six of the largest and richer mines—the Robinson, the Bonanza, the Wemmer, the Ferreira, the Ferreira Deep and the Village Main Reef—and undertook to work them and win the gold on its own account. Either on account of unskilful handling, or because—as is quite possible—the the engineers before leaving had purposely disabled parts of the machinery, this attempt to work resulted in almost complete failure. In October a few thousand ounces of gold were recovered, but operations have since almost entirely ceased. In almost every case the Boer managers came to grief, and the damage done to machinery and appliances at the six mines will take, it is believed, at least $250,000 to repair.

The English managers and engineers were generally obliged to leave, the only exceptions made being in favor of those in charge of the Johannesburg water-works, whose services could not be well spared. A few of the managers who were of other nationalities, have remained in charge of their own or other works. Thus, Mr. Bettel was in charge of the cyaniding operations at the Bonanza Mine while the plant was running; while Mr. Torrente, a Spaniard, who was acting manager of the Rand Central Ore Reduction Company, remained in charge of that company's property. The number of mine officers is very small, however, and they have very little to do.

Johannesburg was almost deserted and was, considering the condition of affairs, very quiet. The active war operations are at a considerable distance, and the administrative headquarters being at Pretoria, left the mining city outside the immediate centers of attention. What future operations will bring is, of course, a matter of conjecture entirely. At present it looks as if the war will be conducted outside of the Witwatersrand entirely, so far as fighting is concerned. Thus far the Boers have shown no special disposition to inflict any damage on mining property, though their feeling against its owners is very bitter.

The sight of mining appliances and machinery, which a few weeks ago were producing gold at the rate of $90,000,000 a year, now standing entirely idle, is unprecedented in the history of the world. The peculiar nature of the gold-bearing deposits of the Witwatersrand has caused a concentration there of mining and metallurgical plants to an extent never known before; and very few districts—certainly no mining districts—have ever seen an equal amount of capital and labor concentrated in such a limited space. The instant paralysis of the entire industry is something the world has never seen before, and is not likely to see again.

It is probable that conditions in South Africa would have resulted in war at some time. Whether the present is the proper time is a question we cannot discuss here. At any rate, the war is a most unfortunate one for the mining industry, and we must hope for an early termination.

NEW PUBLICATIONS.

"Victoria; its Mines and Minerals." Melbourne, Victoria; published by the "Australian Mining Standard." Pages, 200; illustrated. Price (in New York), 75 cents.

This special supplement to the "Australian Mining Standard" is a profusely and handsomely illustrated account of the past history and present condition of the mining industry in the Colony of Victoria. It is an excellent piece of work and contains much useful information. After an introduction which summarizes Victorian mining history, present position and future prospects, the seven districts into which the Colony is divided are treated exhaustively, both from the standpoint of the scientist and the practical miner, the scheme embracing its geology, gold deposition, lead and lode systems, special characteristics, production, famous mines, present position, and general resources.

In the preparation of this work recourse has been had to the very best sources of information, official and unofficial, and besides the work done by the staff of the "Standard," articles have been furnished by the following among other writers: Prof. Liversidge, of the Sydney University; Mr. Reginald A. F. Murray, late Victorian Government Geologist; Mr. James Stirling, Victorian Government Geologist; Mr. Ernest Lidgey, Mr. Herman, Mr. Donald Clark, and Mr. R. A. Moon.

Of equal importance is the section on Victorian Mining Law, being a summary of statute law and regulations, prepared by Mr. Joseph Woolf, Solicitor of the Supreme Court of Victoria, whose experience in connec-

tion with important mining and company suits entitles him to rank as an authority on his subject. In his condensation he has seized upon all salient and important points, and presents them in an easily comprehensible form. The digest cannot fail to be of great value to outside capitalists who contemplate investment in Victorian enterprises, but it is even more valuable to Victorian mining men.

In addition to that bestowed on quartz-reefing and alluvial mining, full attention has been paid to the dredging branches of the mining industry, which are now attracting so much attention throughout the Australian colonies. The subject has been reviewed in all its various phases, bucket dredging, river dredging, paddock dredging, and hydraulic dredging, and a mass of information on each head has been prepared for the benefit of those interested. A special article on "The Evolution of the Modern Dredge" traces the development of the process in New Zealand from its inception to date, and reviews the adoption of dredging methods in the sister colonies.

"Annual Report of the Mine Inspector for the Indian Territory for the Fiscal Year Ending June 30th, 1899." Luke W. Bryan, Inspector. Washington; Government Printing Office. Pages, 84; illustrated.

This report gives a very full account of the condition of the coal mines in the Indian Territory, which are of importance both on account of the extent of the output, and also because they serve to supply a number of railroads and other consumers, in a section but poorly supplied with fuel resources. The total output in the last fiscal year was 1,404,442 tons coal and 29,362 tons coke, while 4,005 men were employed by the companies. These figures show the value of the industry, and the report covers its history very well.

"Proceedings of the Twelfth Annual Meeting of the Montana Society of Civil Engineers, 1899." Helena, Montana; published by the Society. Pages, 64; illustrated.

In a State like Montana it is not surprising that nearly all the members of the Engineers' Society are in some way connected with mining. The members are scattered over a large territory, and are not able to attend frequent meetings, which helps to concentrate attention on the yearly gathering, though several other meetings are held during the year. Besides the address of the retiring president, James M. Page, this number of the "Proceedings" contains four papers of considerable interest. They are on the "Engineering Work at the Montana University"; "Electric Railroad from Butte to Centerville"; "Failure of the Timber Crib Dam of the Montana Power Company"; "Crib Dam for the Butte City Water Company." The Society is an active one and is also a growing one.

"Transactions of the Institution of Mining and Metallurgy, London." Eighth Session, 1898-99. Volume VII. London, England; published by the Institution. Pages, 346; illustrated.

This substantial volume bears testimony to the interest taken in the Institution by its members. Besides the usual record of proceedings it contains no less than 26 papers covering a wide range of subjects and treating of mining and metallurgy in all parts of the world. Some of these papers we have given to our readers from time to time, as the Institution is very liberal and courteous in furnishing advance copies of papers read before it, rightly judging that in this way it best serves the interests of the mining world generally and of its own members.

It is to be noted that the papers are generally of moderate length, the aim of most of the writers being, apparently, to give their information in as condensed a form as possible. It is also to be observed that the members are always ready to discuss the papers read, to criticise them and to supplement them by statements drawn from their own experiences. In this way the discussions form a valuable part of the book and contain a great deal of information which could probably be brought out in no other way. Several of the papers relate to American mines, mining and metallurgical methods, which are regarded abroad with a great deal of interest.

BOOKS RECEIVED.

In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review on another page of the Journal.

"Census of the Commonwealth of Massachusetts, 1895. Volume VI., Part 5: Agriculture." Horace G. Wadlin, Chief of Bureau. Boston; State Printers. Pages, 348.

"History of the Manufacture of Armor Plate for the United States Navy," Compiled by the American Iron and Steel Association, Philadelphia. Pages, 64; illustrated.

"Proceedings of the Twelfth Annual Meeting of the Montana Society of Civil Engineers, 1899." Helena, Montana; published by the Society. Pamphlet; pages, 64; illustrated.

"Practical Forestry in the Adirondacks." By Henry S. Graves. Being Bulletin No. 26, Department of Agriculture, Division of Forestry. Washington; Government Printing Office. Pages, 84; illustrated.

"Geological Survey of Michigan. Volume VI.: Isle Royale and Keweenaw Point." By Alfred C. Lane and Lucius L. Hubbard. Lansing, Michigan; State Printers. Pages, 484; with maps and illustrations.

"Hydraulic Diagrams for the Discharge of Conduits and Canals: Based upon the Formula of Ganguillet & Kutter." By Charles H. Swan and Theodore Horton. New York; "Engineering News" Publishing Company. Pages, 44. Price, $1.

Bulletins of the New York State Museum, Volume V. "No. 24. Life and Entomologic Work of Joseph Albert Lintner." By Ephraim P. Felt. "No. 25. Report of the State Botanist, 1898." By Charles H. Peck. "No. 26. Collection, Preservation and Distribution of New York Insects." By Ephraim P. Felt. "No. 27. Shade Tree Pests in New York State." By Ephraim P. Felt. "No. 28. Plants of North Elba." By Charles H. Peck. "No. 29. Preliminary List of New York Mammals." By Gerrit S. Miller, Jr. Albany, N. Y.; published by the University of the State of New York.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials will only be published when so requested.

Letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

Concentrating in British Columbia.

Sir: In a country such as the Boundary Creek District in British Columbia, in which so much of the ore is but barely up to shipping grade, and in which all the values seem to be held in the pyrites, it would appear as though there should be an opportunity for the installation of concentrating mills in more than one camp. Experiments extending over years by one of the most competent assayers in the province have shown that the values are almost entirely in the iron and copper pyrites. The Bullion, on Olalla Creek, Upper Keremeos, furnishes a good instance in point. A sample assayed at Trail gave 0.10 gold, 1 oz. silver and 16 per cent. copper. Concentrated to 41 per cent, the returns were 0.10 gold, 0.9 silver and 16.8 per cent. copper. It is evident that unless actually on a spur track, or at least in a very desirable position for shipping, there would be a probable gain in concentrating before shipping. Moreover, the fact that the values were in concentrated form would probably lead to a better smelting rate through competition, as the nearby smelters would comprehend that such concentrates might bear a little higher transportation rate, provided the smelting rates were lowered, thereby giving more distant plants a chance to bid.

B.

Victoria, B. C., Dec. 1, 1899.

Statistics in the Zinc Mines.

Sir: Is there not a misleading use of one word in your interesting tables of Missouri zinc and lead product published December 9th? The "tons of zinc ore mined" in 1898-1899 are given as 181,430, but that was really the amount of zinc concentrates or "cleaned zinc" sold. The ore mined, or so-called "rough ore," was from 15 to 20 times that amount. Of course this distinction is known to all persons who are familiar with mining in our zinc districts, but some who scan the table of casualties and read that one man was hurt or killed for every 5,484 tons "mined" may not know that the true proportion was one casualty to 80,000 or 100,000 tons actually taken from the ground. This correction is due to a district where mining and milling are done with remarkable economy, where timbering is unknown in many mines, where hoisting is done almost exclusively with buckets and shafts have neither guides nor timbers. The somewhat archaic practice in Missouri gives a new illustration of the fact that the necessity of unceasing care and attention to the work may be as good a safeguard as mechanical appliances which by protecting reduce the miner's self-dependence and caution.

The number of men employed, as reported by the State Bureau, must be subject to some deductions when they are considered as ore producers, for if 6,000 miners work 300 days yearly at $2 per day, for 300 days their earnings amount to $3,600,000. And if 181,430 tons of cleaned zinc represent 20 times that quantity of rough ore, the amount of the latter is 3,628,600 tons, making the cost for miners alone nearly a dollar a ton. Some old mines giving steady work may pay less than this rate, but, on the other hand, I have not included the outside men. There are a large number of men engaged in opening new ground but not, I should think, half the whole force. The truth probably is that the State Bureau estimates the whole number of men available in the district and not the number at the face on a given day, and its figures may refer to the latter part of 1899 instead of the first half and the last six months of 1898. At the present rate of extraction the cleaned zinc sold this year, January to December, 1899, ought to be about 255,000 tons, corresponding to 5,000,000 tons of rough ore, more or less. Even on this basis 6,000 men working 300 days yearly, or 1,800,000 days in all, would have an average production of only 2¾ tons daily to the man underground. If the actual average is five tons daily to the man and the wages, including the earnings of small leasers, are $1.50, the cost per ton for underground labor alone would be 30c. per ton. The Bureau's estimate indicates that 45 per cent. of all the miners are employed on mines that produce nothing as yet. I enjoy statistics, but I like to have them square up.

There is no part of our country that offers a more interesting mining field than Missouri. The work done there is remarkable, both for cheapness of construction and economy in mining and milling. The true details would be most interesting, but they cannot be obtained until the vicious system of writing and thinking about concentrates as "ore" is abandoned. The actual practice can be obtained only at mines like the Missouri Company's, where the ore is weighed as carefully when it goes into the mill as the "zinc" when it comes out.

New York, Dec. 9th, 1899. John A. Church.

IRON PRODUCTION IN GERMANY.—The output of the German blast furnaces in October was 387,076 metric tons, being 18,013 tons more than in September, and 24,673 tons more than in October, 1898. For the ten months ending October 31st the production was as follows, in metric tons:

	1897.	1898.	1899.
Foundry iron	915,179	1,065,183	1,198,056
Forge iron	1,341,759	1,296,263	1,389,831
Bessemer pig	472,755	440,872	434,865
Thomas pig	2,944,794	3,299,399	3,697,100
Totals	5,674,487	6,101,717	6,719,853

The increase over last year was 618,136 tons, or 10.1 per cent. Of this gain 132,873 tons was in foundry iron; 93,568 tons in forge iron; and 397,702 tons in Thomas (basic) pig; Bessemer pig showing a decrease of 6,007 tons.

PETROLEUM MOTORS FOR COAL MINE HAULAGE.*

By M. J. Kersten.

It is only quite lately that a locomotive working with petroleum has been used in fiery mines, on account of the danger that might result from ignition of gas or coal-dust by the discharge, or by the ignition of the explosive mixture itself; but now the Otto firm at Deutz, near Cologne, Germany, makes a type of locomotive working with benzine that appears to unite the necessary conditions of safety and economical working. These engines are supplied in Belgium by the firm of Fetu-Defize, a branch of the Otto house for thermic motors; and the sizes most generally used in underground workings are those of 6, 8 and 12 H.-P.

In these locomotives the frame, of steel channel bars, is carried by two axles, and receives a single-cylinder benzine motor of four-period cycle; and the main shaft drives through spur gear a second shaft carrying two friction cones, that can either revolve loose or be keyed on the shaft by a friction clutch. Each of the cones imparts (through a pair of spur wheels having different diameters) motion to a third shaft, which is connected with the axles by an endless chain. One cone gives a speed corresponding with a progression of 1.2 m. per second, and the other one of 2 m.; but a start may be made gradually by bringing pressure to bear gently on the spur wheels, which are lubricated by oil contained in the hollow shaft which carries them, all the gear being of steel and accurately fitted.

The endless chain which transmits the motion is constantly running in the same direction; and it passes over sleeves, M, which are loose on the axles, but may (each separately) be made fast thereto by a clutch. When the clutch of axle I is made fast the locomotive runs in one direction; and when axle II is made fast, in the other direction, the chain being kept stretched. The two axles are connected by an endless chain, so that, whatever be the direction in which the engine runs, both the axles are motors. The main shaft makes 300 revolutions per minute for a progression of 2 m. per second; and the friction clutch which determines the speed is controlled by a lever actuated by a screw, the clutch for changing the direction of running being worked by a counterweighted lever.

The benzine, contained in a tin-plate cylinder carried by the locomotive, is forced into the engine by a small pump, entering the explosion chamber in a finely-divided state; and at the same instant the piston draws in air, which is carburetted by contact with the benzine vapor, the stroke of the pump plunger being only 1 mm. The rotation of the motor is regulated by a fly-wheel, which revolves in a vertical plane on one side of the engine; and the motive cylinder is lubricated by mineral oil injected by a small pump, the joints (articulations) being fitted with Stauffer lubricators.

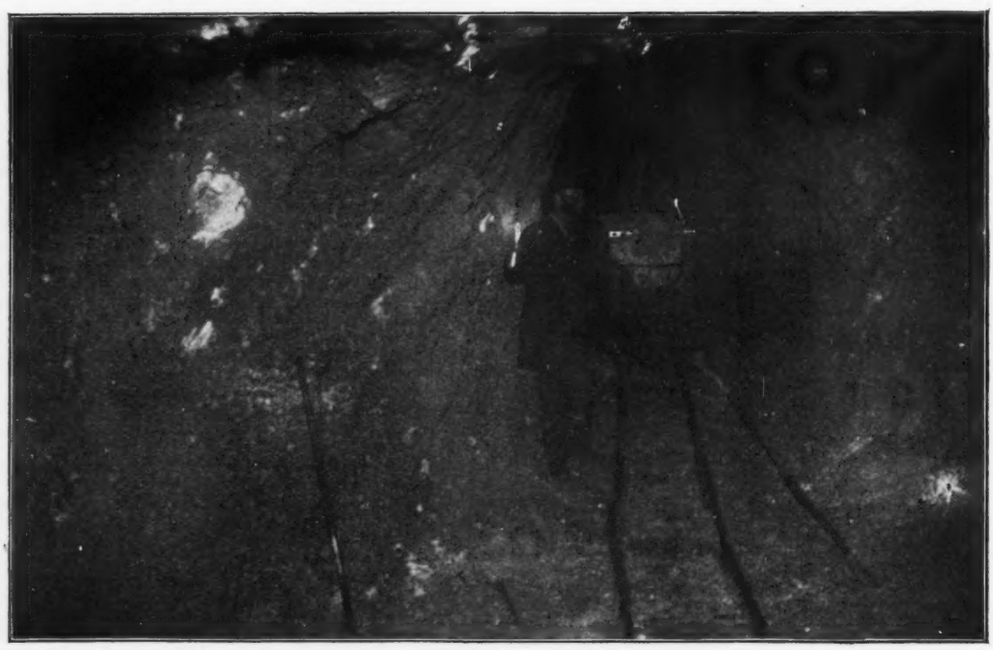
Ignition of the charge is effected by an electric spark, produced by an armature struck by a cam at each admission, and which moves sharply in the magnetic field of a permanent horse-shoe magnet, the spark being produced in the explosion chamber shut in from the atmosphere. The running of the engine is controlled by a centrifugal governor which acts on the distribution cam. Starting is effected in a few revolutions, and for increasing the speed the air admission is diminished for rendering the gas richer, the compression being suppressed. When the engine is standing, for preventing increase of speed a lever is pulled on to, which raises the governor's sliding ring, thus making the admission minimum; and, if the stoppage has to be continued longer, the admission is entirely suppressed, the subsequent start being effected by means of the fly-wheel and a self-starter. An 8-horse engine has a cylinder of 156 mm. diameter and a stroke of 245 mm. The piston is provided with four cast-iron rings, and the cylinder is cooled down by the water contained in two tanks fastened to the sides of the frame, and circulated by a small pump. The products of the explosion escape through wire gauze and pass into the cylinder placed at the front end of the locomotive, in which cylinder they expand, afterward issuing through one of the two ends which is perforated. When the gases reach the outer air their temperature does not exceed 20° or 25° C., so that they do not communicate any sensation of heat to the bare hand; and the motor, with all its mechanism, is enclosed in a plate-iron casing provided with doors for oiling and inspection.

The 8-horse engine is 3.2 m. (10 ft.) long, 1.47 m. (4 ft. 5 in.) wide and 2 m. (6 ft. 7 in.) high, including the cab, while weighing 3.3 tons in running order, and costing 9,500 fr. ($1,900); and that of 6-H.-P. is 2.6 m. (8 ft. 2 in.) long, 1.2 m. (3 ft. 6 in.) wide and 1.3 m. (3 ft. 7 in.) high, without measuring the roof, weighing 2.4 tons in running order, while the width of this engine may be reduced to 95 cm. (2 ft. 11 in.) when it has to run in narrow roads.

All these engines are provided with a hand brake and a bell that is made to sound automatically; and they are capable of running 14 hours with their supply of benzine, the consumption of which is only 400 gr. per horse-power hour. Combustion in the cylinder is perfect, and the escaping gases give out no smell. The daily consumption of benzine is from 4 to 5 kgs., and the speed is 2 m. per second. The flange rails, weighing 7 kgs. per meter, are laid to a 50-cm. (20.-in.) gauge.

These locomotives have been running for more than a year without having required any repairs. The cost for benzine and maintenance does not amount to 5 centimes per ton-kilometer (say 1½c. per ton-mile).

*Abstract of paper in "Annales de Mines de Belgique."



Cross-cut on 24 ft. of Ore, No. 3 Tunnel, Republic Mine, Washington.

ALABAMA MINERAL PRODUCTION.

Recently—November 25th, page 634—we published advance figures for the production of coal and iron ore in Alabama. We have now received the corrected figures for the mineral production of the State, as collected by Dr. Eugene A. Smith, State Geologist, for three-quarters of the current year; the figures are as follows:

		Third quarter.	Year.
Coal	Short tons	1,908,065	5,559,281
Coke	" "	475,668	1,299,550
Iron ore	Long tons	673,845	1,840,773
Pig iron	" "	262,861	773,994
Stone for flux	" "	162,169	415,574
Bauxite	" "	4,371	12,138
Building stone	Cub. ft	17,250	.....

These statistics are compiled from actual returns of about 90 per cent. of the production, and estimates for the balance, based on last year's production. They approximate very closely to the actual results.

The figures show that the production of coal will be not far from 7,500,000 tons for the whole of this year; of coke, 1,800,000 tons, and of iron ore, 2,550,000 tons. The production of pig iron has increased less than was expected, though the blowing in of several furnaces in November and December may bring up the production in the fourth quarter of the year.

YACHT MODELS FOR PARIS.—The commission in charge of the transportation exhibit of the State of New York at the Paris Exposition announces that the display will include the largest number of models of steam and sailing yachts ever brought together. More than 30 different types will be represented.

THE REPUBLIC MINE, WASHINGTON.

Written for the Engineering and Mining Journal by M. H. Joseph.

A description of the Republic Mine and mill by the writer of this memoir was published in the "Engineering and Mining Journal" November 5th, 1898. The property was then owned by the Republic Gold Mining and Milling Company of Spokane, Wash., which was reconstructed during March of the present year under the name of the Republic Consolidated Gold Mining Company, its capital being increased from 1,000,000 shares, at a par value of $1, to 3,500,000 shares of like value. On April 1st the new company took over all of the stock of the original concern and immediately assumed the management of its property. The stock is now principally owned in Montreal and Toronto, Canada, and Spokane, Wash.

The first dividend of the original company of $30,000, equal to 3 per cent. of its entire capital stock, was paid October 10, 1898, and a total of $120,000 was paid up to the date of the reconstruction of the company. On April 10th, 1899, the new company paid a dividend of $35,000, equal to 1 per cent. of its entire capital stock, and it has since paid, up to October 10th, 1899, a total of $245,000, making in all a total of $365,000 paid in dividends from the earnings of the mine during 2½ years of active development.

Up to October 1st, 1898, the total production of the mine was about 4,000 tons of ore, which was broken down in development work and in the stopes above the No. 2 tunnel level. Of that quantity 1,223 tons were shipped to the smelters and averaged in value $180 per ton, and the balance was of medium and low grade. During the preceding month the output was 270 tons, which yielded at the company's mill $28,000, and 143 tons shipped to the smelters, which returned a net profit of $35,000, equal to $244.75 per ton. No ore had been removed from above the No. 1 tunnel level except what became necessary in upraising 125 ft. to the discovery point on the surface, at the center of the claim, now designated as the north shaft, and in raising to the surface from the stopes between the Nos. 1 and 2 levels, 155 ft. to the south of it. The development up to that time had shown the average width of the pay shoot on the No. 1 level to be 7 ft., and its length 210 ft. It began at 10 ft. north of the turnsheet, at the intersection of the vein by the cross-cutting tunnel, and terminated 200 ft. south of it. ; The rise of the pay shoot, northward, towards the surface, was estimated at 45°, and the dip southward, to the No. 2 level, 60°. It had been proved 210 ft. in length on the No. 2 level and was partly stoped on 9 floors above it, which were 8 ft. apart. The average width of the pay shoot on the No. 2 level was estimated at 10 ft. and that of the vein 14 ft. A section of the pay shoot on the No. 2 sill floor, above the No. 2 level, had been stoped 40 ft. in length and 25 ft. in width, and that was supposed to be the widest part of the vein. The values of the pay ore ran from about $20 up to $1,000 per ton. The lower grades were treated at the company's mill and the high-grade material was shipped to the Tacoma and Everett smelters on Puget Sound. The richest ore had been found on the seventh floor, above the No. 2 level, and one day's sampling from it ran as high as $687.17, while the shipping average of the mine the same day was $369.40 per ton. The mill had then a capacity of 10 tons, which, later on, was increased to 35 tons a day.

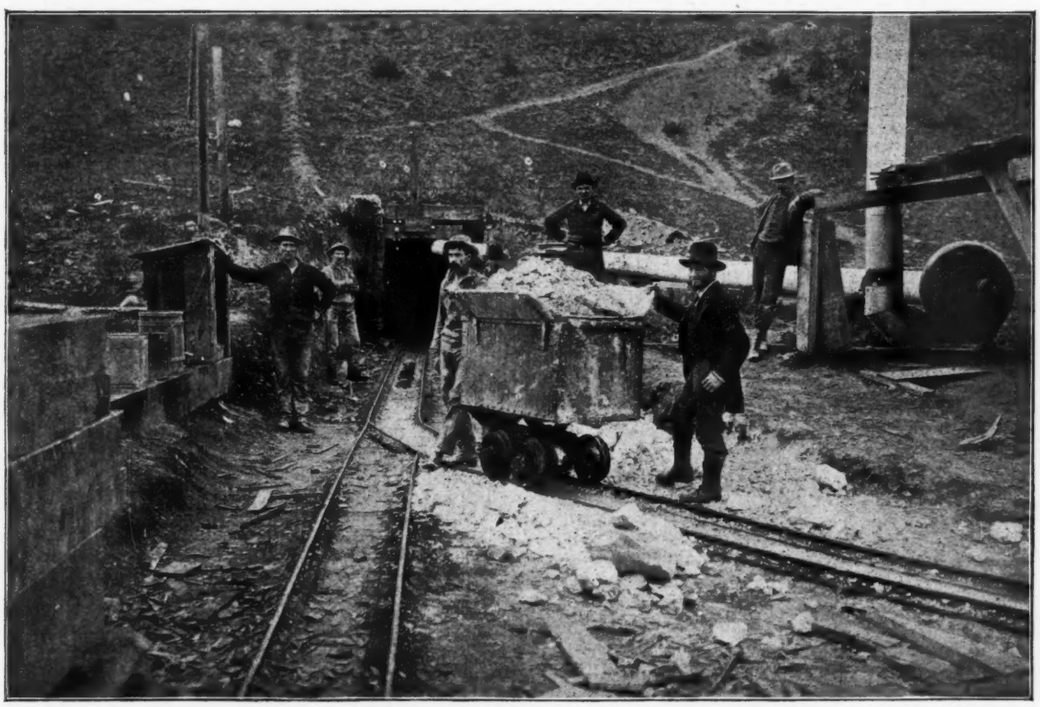
The exploitation of the mine during the last 12 months has wrought great changes in it, as may be seen by the following description:

The vein, as surveyed, strikes on a mean course of N. 2° E. and dips east from 75° to 81°, with a mean dip of 80° from the surface. The main ore shoot terminates at the surface, at a point approximately 700 ft. north of the south end line. It dips south from the surface to the first level 40° to 41°, from the first to the second about 60°, and from the second to the third 70° from the horizontal.

A northerly and southerly break occurs on No. 3 level, 30 ft. east of the main ore shoot line, which is taken by some persons, by reason of certain fault planes which have been developed on the three levels of the mine, to be the hanging wall; and for the same reason they assume the enclosing walls of the vein to be 70 ft. apart, with the foot-wall crossing the No. 1 tunnel 90 ft. east of the entrance and 60 ft. west of the main ore shoot.

The foot-wall formation of the vein is andesite-porphyry, and that of the hanging wall porphyritic conglomerate, with metamorphic argillaceaus sandstone overlying it.

The later developments in the mine have shown that the termination of the main ore body on its course northward is nearly vertical, but on its course southward it inclines from 40° near the surface to 70° upon the lower levels. Thus it is seen that it lengthens to the southward as the depth of the vein increases. Richer deposits of ore are found below than were excavated above, and the general average values have shown an increase with additional depth; and, like the Comstock Mines in Nevada, the ratio of gold to the silver contents increases as the additional depth on the vein is attained. From the surface down to No. 2 level the gold and silver yield of the ore were nearly alike in weight, almost ounce for ounce, but on the No. 3 level the yield of silver is about 2 to 1 of gold.



No. 4 or Mill Tunnel, Republic Mine, Washington.

The ore is usually broken down in the mine, as nearly as possible, in three grades, the highest running from $360 down to $100, making an average of $175 to $200 per ton. The second grade runs from $100 down to $30 and is made a $65 average; and the third grade runs from $30 down to $5, and makes an average of about $20 per ton. No more of the lowest quality of ore is broken down than can be avoided, as there is no present method available for its treatment. There are, however, great masses of it in the mine, and, no doubt, intermixed with it will eventually be found richer material.

It would be a very difficult thing to convey to the reader a very clear conception of the changes that have been made in the Republic Mine during the past year, but a fair idea may be conceived from this description.

Beginning at the intersection of the pay shoot by No. 1 tunnel, at a depth of 125 ft. below the surface, a drift runs north from the turnsheet 200 ft. It extends 130 ft. on ore of the value of $30 to $50 per ton, 5 ft. in width, to a break; it runs thence 60 ft. through barren ground and again into ore, which extends 10 ft. to the end, and is cut off by another break.

Going south from the turnsheet, on the same level, the main drift has run on the pay shoot 185 ft. in rich ore, averaging 10 ft. in width, to a vertical fault, of later origin than the ore body. The fault cutting off the ore from the drift line, the drift was turned off to the eastward 8 or 10 ft. and again ran into ore 1 ft. in width, upon which it followed 30 ft.; and the ore broken down in this section had a shipping value of $300 to $700 per ton. The drift runs thence 60 ft. further south on ore of 8 to 10 ft. in width. From above the main level, corre-

sponding with the 185 ft. above referred to, the ore body has been excavated 100 ft. in length, upon 10 floors, 9 ft. apart. A block of ore that will equal three floors of the same dimensions and average in value $70 per ton, ounce for ounce in gold and silver, remains yet unbroken. No. 2 shaft, which is down from the surface 30 ft. in ore, is situated 230 ft. south of No. 1 shaft. In making a connection between the south winze and No. 2 shaft, 75 ft. south of it, the ore that was excavated averaged $260 per ton.

The question of vein-walls in the Republic Mine is to the ordinary observer a perplexing one, and the responsibility of answering it is the province of the managing engineer in charge of the property. At the northern termination of the main ore body, on No. 2 level, the pay shoot is separated from the porphyrite on the foot-wall side by an almost vertical northerly and southerly wall. It has on it a clay gouge which forms a line of demarkation between the ore body and the country rock on the west side of it; yet nowhere in the mine can another wall be found which, from its dip and strike, may be reconciled as a part of or in any way connected with it; but ore has been found in several places west of its course. It is possibly a fault, but its connections have not yet been established. There are 2 or 3 breaks forming smooth walls, and dipping about 45° eastward, which appear on Nos. 2 and 3 levels, and one of them may possibly be identical with the assumed foot-wall found 60 ft. west of the pay shoot upon the No. 1 level.

From the hanging-wall side of the main drift, on No. 2 level, 8 ft. east of the main ore body, and south of the north shaft, a cross-cut discloses a separate streak of ore, 18 or 20 in. wide, with porphyrite intervening. Going north from the turnsheet on the No. 2 level are 2 diverging drifts, respectively 100 and 110 ft. in length, which are connected at the north ends by a cross-cut. The cross-cut passes eastward beyond the one and westward beyond the other, disclosing walls at both ends, about 60 ft. apart, which dip nearly alike, about 79° or 80° from the horizontal.

No evidence of any lateral faulting to the east or west has yet been discovered in the Republic Mine, but the occurrence of disturbances at different times is shown by the various fault lines and striation and attrition marks, all of the latter being either vertical, or nearly so, and inclining on similar planes with the dip of the vein.

No. 2 tunnel strikes the main ore body at its northern extremity, and the pay shoot has been excavated thence southward, 80 ft. in length, on an average width of 10 ft., clear through to No. 1 level above. Much of the ore extracted therefrom having been of the highest grade was shipped to the Everett and Tacoma smelters. Going south from the turnsheet on this level a block of quartz from 4 to 10 ft. in width, about 80 ft. long and 90 ft. high, with values believed to range from $40 to $80 per ton, still remains in place. About 145 ft. south from the turnsheet the main shoot has been opened on ore, which was broken into on the foot-wall side, and proved from 22 to 25 ft. wide, but is there split by a porphyry horse. It has been partly stoped, the ore running from $30 to $100 per ton on the foot-wall and as high as $360 on the hanging-wall side. The foot-wall and hanging-wall sections of the shoot unite about 12 ft. below No. 2 level, as may be seen upon the intermediate workings between it and No. 3 level. Between Nos. 1 and 2 levels a block of ore 70 ft. in length, the full width of the pay shoot, and going down from the one level to the other, still remains unbroken.

A winze connects No. 2 and No. 3 levels and from it, at a depth of 60 ft. below No. 2, a drift was run north 105 ft. on ore which yielded from $70 to $370 per ton. A large part of the same section of this ore body has been stoped up to No. 2 level 22 ft. in width, but there is still a large block of ore unbroken north of the winze. A drift was run south 50 ft. in ore of first class value on the foot-wall side of the intermediate level, but none of the ore above, below or on either side of it has yet been stoped. There has been very little prospecting done between the intermediate and No. 3 levels, beyond a small drift and cross-cut, so there is no way of even estimating how much ore remains unbroken in that part of the mine. The vein has been opened by four tunnels to a depth of 600 ft. below the cropping. The fourth, which, by reason of its being on a level with the receiving floor of the mill, will be known both as No. 4 and mill tunnel, recently intersected the vein 2,225 ft. west of its portal. Here the vein is 27 ft. wide, as shown by a cross-cut. From the latter drifts have been started, and at this writing the south drift is in 15 ft. in ore that samples from $30 to $159 per ton. Thus is shown the downward continuity of the great ore body. Through this tunnel the ore will be run by the mine cars direct to the mill.

No. 1 tunnel enters the hill from the west and the others from the east or hanging-wall side of the vein. A 3-compartment shaft for the development of the mine below No. 4 tunnel level will be started as soon as the general conditions upon the latter are fully known and a suitable site selected.

No. 3 tunnel strikes the vein 460 ft. north of the south end line of the Republic claim, about 12 ft. east of the main north and south drifts on the ore shoot. A cross-cut has developed the ore shoot 34 ft. in width and the first samples taken from it assayed from $14.56 up to $310 per ton. The main south drift from the cross-cut, on the hanging-wall side, was run 160 ft. in clean quartz of 3 to 8 ft. in width, not a sample from which ran lower than $176, and the highest assayed $298. The working average of the material, in bulk, was $250 to $260 per ton.

About 30 ft. south of the turnsheet, upon this level, a split occurs in the vein, one branch striking southwest, with a drift running 30 ft. on it, on ore of $50 to $60 value. The drift continuing thence, a short cross-cut from it shows this branch of the ore shoot splitting again.

The south drift from the main ore shoot runs 300 ft. on a pinch, and thence passes 20 ft. through a body of quartz, the actual width of which has not yet been ascertained; but from the end of the drift a cross-cut has been driven about 50 ft. to the foot-wall, 24 ft. of which is through clean quartz that runs about $100 per ton. From this cross-cut a drift runs 60 ft. to the south end of the Republic and continues into the Jim Blaine ground. Going north from the turnsheet, on the foot-wall side of the main ore body, a drift runs 100 ft. on ore of a value of $250 per ton, similar to that south of the turnsheet, and proves the length of the ore body on this level to be fully 260 ft. The width of it on the north end has yet to be ascertained. The drift continues in a northerly direction, following on a smooth wall which is believed to be a fault. It is distinguished by a tough, black, leathery gouge. The drift runs north from the ore shoot about 38 ft. and cross-cuts are being driven from it to determine the exact position of the vein. A cross-cut has been carried 30 ft. eastward from a point in the drift nearly 200 ft. north of the main ore body, which has broken into a mixture of porphyrite and quartz, no doubt belonging to the vein. This material is wider in the floor than in the roof of the cross-cut, and as the quartz assays well it is believed that good ore will be found underneath it. At about 20 ft. south of the turnsheet a winze has been sunk on the hanging-wall side of the ore shoot and drops on the foot-wall at a depth of 30 ft. below No. 3 level, which it has followed to a total depth of 50 ft. The ore from this winze assayed up to $180 and averaged about $125 per ton. A drift has been driven in each direction, north and south, on the ore shoot, from the bottom of the winze, the former 50 and the latter 40 ft. The ore from the north drift has averaged in value $40 to $50 per ton, and that from the south drift about $120 per ton. Owing to the very rich streaks of ore that are being developed in the latter, the average value may be largely increased. Selected specimens recently taken from the south drift assayed respectively $2,150.54 and $4,734.64 per ton.

The daily output of the mine for the past year cannot be stated, as no account was kept of it. Beyond the few shipments of high-grade ore to the smelters, all of the ore broken down in the mine up to the time the ore bin at No. 3 tunnel was built, was dropped on the dump, and the ore wagons were loaded from it to supply the mill. Since then the production has been regulated by the requirements of the mill. For the past year the mill has treated, according to estimate, about 12,000 tons of ore. The company being practically a close corporation no direct information on the quantity and value of the ore treated is given for publication, but it is given to the shareholders by circular. The future output of the mine may be largely increased, but it will be regulated by the future cost of treatment and capacity of the mill. The following analyses were returned from two samples of ore from the Republic Mine by C. M. Fassett of Spokane:

Sept. 17th, 1897.	Per cent.	Jan. 21st, 1898.	Per cent.
Silica	85.61	Silica	90.55
Alumina	6.37	Alumina	4.73
Iron oxide	3.16	Iron oxide	2.57
Lime carbonate	4.37	Lime	0.90
Sulphur	0.04	Manganese	0.20
Manganese	Trace	Combined water	1.20
Zinc	Trace	Sulphur	Trace
	99.55		100.15
Gold	2.95 oz. per ton	Gold	3.95 oz. per ton
Silver	4.30 oz. per ton	Silver	3.9 oz. per ton

The concentrates from the latter sample, under a microscopical examination, were found to consist almost entirely of magnetic iron, with a little heavy silicate and an occasional crystal of iron pyrite and zinc blende; but no traces of arsenic, antimony, lead or copper were found by the microscope or chemical analysis.

The company anticipates a reconstruction of the mill in the near future and will increase the capacity to 100 tons daily, when a modification of the ordinary cyaniding method will be adopted in place of the Pelatan-Clerici process now in use. In the mean time all of the ore of a higher grade than $100 per ton will be shipped to the smelters at Grand Forks and Trail, B. C.

The present treatment capacity of the mill is 35 tons, but the mill power is sufficient for 75 tons per day. The mill is equipped to run either by steam or water power, the latter being principally used during the summer season. The plant consists of the mill building, 185 ft. long by 55 ft. wide, and an average height of 24 ft.; an assay office, including a laboratory, furnace and weighing rooms; a 60 by 32-ft. compressor room, a storage house, coal and oil rooms and a 22 by 60-ft. tailings and experimental mill. In connection with the mill and mine are also commodious machine, blacksmith and carpenter shops, the first being equipped with a lathe, drill press and other mechanical appliances for such work as is usually required about a mining and milling plant.

The mill equipment consists of a 75-ton ore bin, an automatic ore feeder, three 25-ton ball pulverizers, a Blake rock crusher, two sets of Cornish rolls, two preparing tanks, 10 Pelatan-Clerici vats and equipments, with steam, air, water and electric power.

The electric plant consists of two General Electric Company's and one Electrical Engineering Company's 500-ampere and 12-volt dynamos for electric action and treatment of the ore; a 280-light, 125-volt General Electric Company's machine for lighting the mill and mine, together with a switchboard and instruments and all the necessary wiring.

The Pelatan-Clerici vats are directed by means of a switch for each individual one, in order that they may be separately tested for current every two hours, it being necessary for the process used to know what voltage of current is passing through and what each tank is taking. The dynamos are driven separately by a 35-H.-P. Westinghouse engine.

The power for the mill is furnished by a 14 by 36-in. cylinder Fraser & Chalmers 180-maximum-H.-P. Corliss engine running at 86 revolutions per minute, and two Fraser & Chalmers boilers, one 60 and one 85 H.-P.

The water equipment consists of a 4-ft. Pelton wheel, with a double nozzle, and a maximum force of 125 H.-P. It runs at 300 revolutions per minute under a 60-ft. head. A 50-H.-P. water motor is especially used for running the dynamos, and a 3-ft. Pelton wheel of 60 H.-P. is used to run a 5-drill Rand air compressor, which is used for running the power drills in the mine.

The officers of the company at Republic are Mr. R. G. Edwards Leckie, general manager; W. J. Casey, superintendent; D. F. Hallahan, secretary.

THE CAPE NOME GOLD FIELD, ALASKA.

Written for the Engineering and Mining Journal by Paul F. Travers.

The writer has recently returned from Nome, Alaska, the much talked of new gold-field, and can verify many of the statements which seem to an outsider greatly magnified. Such is not the case, however; in fact, but half the possibilities of that extremely rich country have been dwelt upon. Take the beach mining, for instance; there is a field entirely free to anyone, that is, nobody can claim a location by pre-emption because the United States Government reserves it for a highway from low-water mark to 60 ft. above high-water mark, and the sand is so rich that you can see the gold. This summer I was in the interior when this beach strike was made, and in two months' time there were 2,000 people working side by side for 10 miles up the coast on that strip of sand. It was very common for a man to take out $25 a day. I saw $250 taken out of a cubic yard of sand, and reports of much richer ground can be substantiated. It is hard to believe, but it is really so, and the ease with which this wealth can be secured is astonishing. No elaborate machinery is necessary; a simple soap box converted into a rocker is enough, the sand being sifted on blankets. You hold your location by occupation and you work it out in a week or less; then you can take up another piece. The beach last summer was worked in three lateral lines, and the lower line of holes (nearest the tide) proved to be the richest, although the most difficult to work on account of the water flowing into the hole at every tide. I have a vivid recollection of having worked hard all the week stripping the ground and getting out my pay-dirt, scraping bed rock very carefully and piling it up securely (as I thought), only to see the tide come up over night to an unusual height and wash my big pile of pay away. The only consolation I have is that I don't know how much I lost.

BEACH MINING AT NOME, ALASKA.

All the work last summer was done by hand, with rockers. My rocker proved to be the best one on the beach, for after innumerable experiments, I finally adopted astrakhan cloth for the aprons on the blanket. The aprons were set at an angle of 45°, the blanket at 15°. The black sand which holds the gold looks like iron filings, and being nearly the same specific gravity, it is almost impossible to separate it from the gold without the use of quicksilver. Of course the amalgam does not leave the gold in such a nice shape as using the blower, but it is so much more rapid that it is universally used. The trading companies accept it all at $16 per ounce.

Next year the beach mining will be carried on by machinery, and for ten miles you will see nothing but steam engines. All the coal or oil to feed these boilers must be brought in, as there is no wood on the coast to burn. Instead of rockers, sluices will be employed; consequently an enormous quantity of sand will be handled, and the output of gold next year from Nome ought to be very large.

How much individuals will make there is uncertain, of course, but there will be no such hardships as in the Klondike. Nome is in direct communication with Seattle, the steamers touching there first 12 days out. Thus there will be plenty of stores, and prices reasonable. Wages this season were $10 per day. Some of the sluices on the creeks were turning out $1,000 a day, and I saw several large nuggets taken from them. The market value of creek claims was $100,000.

PRESENT COMMERCIAL METHODS OF COPPER ASSAYING AND ANALYSIS.

Written for the Engineering and Mining Journal by Titus Ulke.

The following outlines the daily work of a copper works chemist and assayer at one of our very largest and best equipped electrolytic refineries. The chemist and assayer has an assistant, whose chief duty is to attend to the ordinary assay work, and a helper.

Before beginning to describe the methods of analysis and assaying we will briefly sketch the place where and the means by which these, in the typical case selected, are carried out.

Laboratory balance and assay room form a block about 40 by 60 ft. adjoining the main office, and are well provided with lighting and power current, water and gas. The laboratory consists of a room about 40 ft. square, well lighted by means of six high and wide windows and has a door leading to office, balance room and assay room respectively. It is provided with work tables on the north and south sides, two sinks, drain board and a work table for rapid suction filtration and for arsenic distillation on the east side, and on the west side with a titration table and heating bath and acid hood. The latter has three compartments, one arranged for general chemical work and supplied with iron plates and two efficient electric heaters, and the other two compartments used for dissolving coppers and for generating hydrogen sulphide gas, respectively.

The assay room is provided with two muffle furnaces run by gas, a gas melting furnace holding a large sized crucible, electric motor and fan, pulp scales, bucking board and the usual appliances needed in assaying.

Lastly, the balance room contains a writing desk, balance table supported on separate pillars and five scales or balances, from the coarse copper bullion scales up to the sensitive gold balance.

The assay and chemical work required to be done may conveniently be classified as follows:

Frequency of determination to be made.	Material.	Determinations.
Daily	Solutions (electrolyte)	Sp. gravity, Copper or bluestone and free acid.
	Copper bullion and anodes	Cu, Ag, Au.
Weekly	Cathodes	Cu. Ag. As, Sb.
	Slimes	Cu, Ag, Au.
	Silver slabs	Ag, Au.
	Gold bar	Au.
	Solutions	As, Sb, Fe, Cl.
	Blister and refinery slags	Cu, Ag, Au.
	Cement copper	Cu, Ag, As.
	Wire bars	Cu, Ag, As, Sb.
Occasional	Pig copper	As.
	Blast furnace slags	Cu.
	Blast furnace pots	Cu, Ag, Au.
	Coal, limestone, boiler-scale, water, ore, matte, etc	Vary according to the requirements of each case.

When the copper blast furnace is being run, say during three months or so in the year, daily determinations are usually made of the blast furnace pots for copper, silver and gold, and two blast furnace slags are run daily for copper.

The composition of the electrolyte must be frequently determined in

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order to be able to properly control the refining process. In general it suffices to ascertain the amounts of bluestone, free acid, arsenic and antimony in the solution.

To determine the amount of bluestone and free sulphuric acid, a quart bottle full of the solution from the main feed launder of each system is taken daily and its specific gravity determined. The mode of procedure is then as follows:

1. Free Acid and Bluestone in the Electrolyte (Solution).—Take 10 cc. of the solution, dilute with warm water and run in from a burette a slight excess of caustic soda of known strength. Bring to a boil and filter and wash well. Titrate back excess of caustic soda in filtrate with standard sulphuric acid, using a few drops of phenolphthaleine as an indicator. Now dissolve the copper precipitate in a little dilute nitric acid, make ammoniacal and titrate with cyanide. This gives the percentage of copper present. From this the amount of bluestone is calculated by multiplication with the factor 3.95. Then the amount of acid required to combine with the found amount of copper is calculated by multiplying the percentage of copper by the factor 1.555. This gives the combined acid, which taken from the total acid, as found above, gives the free acid. Time required for the determination, about half an hour. The method of determining the free acid in an electrolyte by using the end-reaction with ammoniacal copper solution is not recommended, because certain foul solutions easily become turbid on standing or show cloudiness upon slight dilution, which mars the end point reading.

2. Arsenic in the Solution.—Place 10 cc. of the solution in a flask, add a few small crystals of ferrous sulphate and 20 cc. hydrochloric acid and distill. The distillate is collected in a small breaker containing a few cc. of water or just enough to cover the end of the condenser. The distillation is continued until contents of flask bump or approach dryness.

Neutralize excess of acid in beaker with caustic soda, leaving it only slightly acid. Then add a few grams of bicarbonate of soda, 10 cc. starch solution and titrate with standard iodine solution. The reaction occurring may be represented as follows: $Na_3AsO_3 + I_2 + H_2O = Na_3AsO_4 + 2HI$.

To standardize the iodine solution, weigh up a little arsenious acid, dissolve in caustic soda, make slightly acid with HCl, add bicarbonate and starch solution and titrate to blue color.

Time taken to make an As determination, one hour. By using a small distilling flask, etc., and 5 cc. of solution, the time required may actually be reduced to about 15 minutes.

3. Antimony in the Solution.—Take 20 cc. of the solution, make ammoniacal and add hydrogen sulphide. Digest, filter off precipitate and treat filtrate with hydrochloric acid. Usually allow to settle over night. Separate the arsenic from the antimony by means of concentrated hydrochloric acid and precipitate the antimony in filtrate as sulphide by hydrogen sulphide. Filter through a weighed Gooch crucible and after washing with carbon bisulphide and alcohol weigh as Sb_2S_3, or dissolve the wet precipitate of Sb_2S_3 through filter with ammonium sulphide into a weighed porcelain crucible, oxidize with nitric acid and weigh as Sb_2O_4, from the weight of which the percentage of antimony in the solution analyzed can easily be calculated.

4. Iron in the Solution.—The iron present is easily found by oxidizing 100 cc. of the solution, adding ammonia, boiling, filtering off precipitate, dissolving the latter and repeating the precipitation. Weigh as Fe_2O_3 or titrate the amount of iron present by any of the usual methods or determine colorimetrically, using a standard solution of iron for comparison, and ammonium sulphocyanate or potassium ferrocyanide as an indicator.

5. Chlorine in the Solution.—This is determined by adding silver nitrate of known strength to 200 cc. of the electrolyte, heating and adding additional nitrate until cloudiness ceases, or all the chlorine present is precipitated. From the number of cc. of silver nitrate used the amount of Cl present can be calculated. Occasionally the precipitate of silver chloride is filtered through a weighed Gooch crucible, washed, dried and weighed, the corresponding quantity of chlorine being easily found. The amount of chlorine in the solution generally lies between .001 and .05 per cent. The time required for this determination does not exceed 2 hours.

6. Copper in Copper Bullion, Anodes, Etc.—If the sample is not uniform in its copper content, take 20 g., dissolve, etc., and use an aliquot part for electrolysis. If uniform, weigh out 1 g. of the granules or filings into a glass beaker about 2 in. wide and 4 in. high, and dissolve the copper in 3 cc. nitric acid, dilute with a little water, and add 2 cc. ammonia and 3 cc. of concentrated sulphuric acid. Now dilute to 150 cc. and electrolyze, using the lighting current, if convenient, and regulating the resistance with lamps.

After complete deposition, wash the copper plated platinum cylinders with water and then with alcohol as usual and weigh up. Time ordinarily taken for determining the copper in a lot of 12 bullion samples in duplicate: 15 to 16 hours.

7. Copper in Slags.—(Blister, Refinery and Blast-Furnace Slags): Place 1 g. of the slag in a platinum dish, dissolve in nitric acid, allow to settle and pour off solution into a beaker and set aside. To residue add a little strong sulphuric acid and a little hydrofluoric acid and evaporate to sulphuric fumes. Take up with water and add to first solution. Then make ammoniacal, filter off the iron precipitate, redissolve and reprecipitate, and finally titrate, as usual, with cyanide. Time: 1½ hours.

8. Arsenic in Cathodes and Wire Bars.—Place 20 g. of the material in an 8-oz. or medium size flask, add 75 to 100 cc. saturated ferric chloride solution and 75 cc. hydrochloric acid and distill.

Collect in beaker of water and proceed either 1, as described in method of determining arsenic in solutions, except that a very weak solution of iodine is used in titrating, on account of the small amount of arsenic present, or, 2, precipitate the arsenic in solution with hydrogen sulphide, weighing up the As_2S_3 in a Gooch crucible, after washing first with alcohol, then with carbon bisulphide, and again with alcohol. Time: 3 to 4 hours.

9. Arsenic in Refined Copper. (Aller's Method).—To 30 g. of the refined copper add 30 g. of potassium chlorate, 50 cc. cold water and 10 cc. HCl. Boil, cool, add 20 cc. HCl, boil, cool again, add 30 cc. more of HCl, boil and make a final addition of 50 cc. of HCl. Warm gently for 10 minutes and decant carefully into a beaker. To the residue (which should not exceed 2 g. in weight) add a little water and again decant into the same beaker and place in the latter 2 g. of potassium chlorate. Boil until all chlorine is expelled. Now transfer the solution of cupric chloride into an 8 oz. distilling flask and add to it the insoluble residue and 20 g. more of the sample for analysis, making 50 g. taken in all.

Heat the flask gently, collecting the distillate passing through the Allihn condenser in a beaker, and when bumping occurs add 30 cc. of HCl through a separatory funnel. During the process of distillation most of the cupric chloride is reduced by the dissolving copper to cuprous chloride. Continue the distillation until bumping again occurs.

The distillate, in which all of the arsenic is present as arsenious chloride, is now treated with H_2S and the amount of arsenic in it determined, as follows, colorimetrically:

Into a beaker containing a saturated hydrogen sulphide solution of the same bulk as the distillate, a standard solution of arsenious acid (As_2O_3 dissolved in KHO and acidified with HCl) is run from a burette until the density of color of the solution is identical with that of the distillate. The number of cc. of standard solution used then determines the percentage of arsenic in the refined copper. Time required: 1 to 2 hours.

10. Arsenic and antimony in Copper Bullion. (Aller's Method.)—Dissolve 6 g. of the copper bullion in 15 cc. hydrochloric acid, 30 cc. water, and 6 g. potassium chlorate in an ordinary flask. Pour in the acid slowly and apply gentle heat. Add 30 cc. of hydrochloric acid and warm gently until chemical action ceases. Decant off solution from any particles of undissolved copper, which latter should not exceed ½ g. To the solution add 1 g. potassium chlorate and boil until all free chlorine is driven out. Place solution in a distilling flask with the undissolved residue and add to it 4 g. of the copper sample which is being analyzed and proceed to distill over the arsenic in the usual manner, two additions of hydrochloric acid (20 cc. each) being made as the distillate evaporates down. The arsenious chloride in the distillate is precipitated with hydrogen sulphide and weighed up as arsenious sulphide. To the residue in the flask add 75 cc. of a saturated solution of zinc chloride and distill, placing a new beaker to collect distillate. The contents of the flask are now evaporated down almost to fusion, allowed to cool, increased by the gradual addition of 20 cc. hydrochloric acid and again evaporated down almost to fusion. This operation is repeated a third time, when all the antimony will be found in the distillate and can be determined, as the arsenic was, by precipitating with hydrogen sulphide and weighing up in a Gooch crucible as Sb_2S_3.

The percentages of arsenic and antimony in copper bullion have been accurately determined as above, it is claimed, in about 2 hours.

11. Gold and Silver in Copper Bullion Anodes, Wire Bars, Etc.—To determine the silver in wire bars and cathodes, take 2 A. T.; of all other material, such as copper bullion and anodes, 1 A. T. is amply sufficient.

Dissolve in nitric acid and filter off the gold. Add about 2 cc. of saturated salt solution to filtrate and if little or no precipitate appears, lead acetate and sulphuric acid, to gather the small amount of silver present. In any case sufficient salt solution is added to precipitate all of the silver present, and the solutions are allowed to stand over night to settle the AgCl.

At some works the gold is not filtered off, but a salt solution of known strength is used, the required amount of the latter being calculated or judged by previous trials. This does very well when the bullion treated runs very uniform in its silver contents, but is not a method to be recommended for custom works receiving bullion varying greatly in contents of precious metals.

The two filter papers containing the gold and the silver chloride are placed in a scorifier and dried in front of muffle. The filter paper is now burned off, taking precautions to prevent dusting and loss of precious metals, if necessary, by covering the assay with a little soda bicarbonate and an inverted scorifier. Test lead is now spread over the residue and precipitate, and it is scorified and assayed in the usual manner for silver and gold. Time usually consumed: 24 hours.

Occasionally, instead of this way of determining the gold in copper bullion, the common scorification method is used, which is carried out as follows:

Weigh out 10 samples of 0.1 A. T. each and scorify with 50 g. of test lead, as usual, and pour. Remove the slag adhering to the lead buttons and repeat the scorification twice, finally uniting five buttons into one and thus obtaining two lead buttons weighing about 12 g. each and corresponding to 0.5 A. T. of the original bullion. These are then cupelled, as usual, and should check each other within the usual tolerance. Some assayers claim that this method, while involving considerably more labor and expense, gives results from 0.06 to 0.1 oz. gold higher than the ordinary method, on bullion running 2 or 3 oz. of gold per ton.

12. Gold and Silver in Blister and Refinery Slags.—One A. T. of the slag, which often runs 40 to 50 per cent. Cu, is reduced to a copper button by melting with sufficient reducing flux (argols, soda and borax) in a Battersea crucible of size E or F.

The copper button, after being separated from all adhering slag, is dissolved in nitric acid and assayed for silver and gold by the method described above for copper bullion.

13. Gold and Silver in Slimes.—Weigh out 2 assays of 1/20 A. T. each and scorify them in the usual way. First cupel one of the lead buttons and weigh the resulting silver bead. Wrap up the latter in lead foil until it approximately equals the weight of the other lead button and cupell both and weigh. The loss in weight of the first bead gives the loss in cupellation, which must be added to the other bead as a correction.

The slag from the scorification is rescorified with borax and 16 g. of test lead, and the resulting lead button cupelled. The weight of the bead thus obtained is added to the corrected weight of the second one above, and the combined beads are parted, etc., in the usual way.

The time taken to determine the gold and silver in slimes should not exceed 3 hours.

All the methods indicated above, while commercial, with ordinary care and skill in manipulation give results which check very closely.

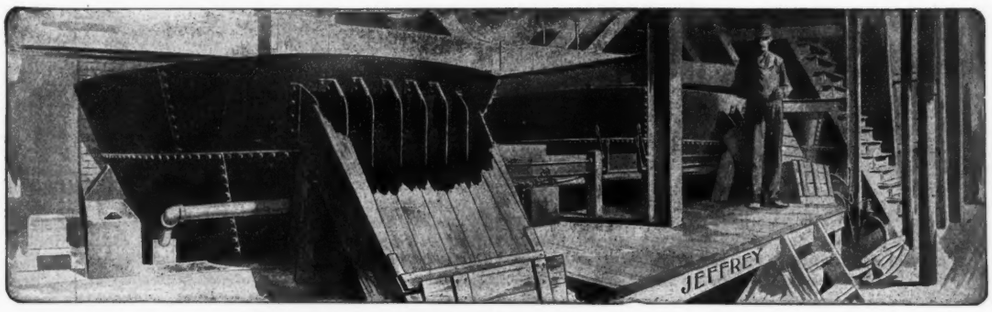
Occasionally the chemist is called upon to make other determinations, such as the fixed carbon, volatile matter and sulphur in samples of coal, the lime and magnesia in limestone, and the constituents of boiler scale. The methods of making these determinations properly come under the head of general laboratory work, and are so well known that they need not be described here.

In conclusion, the writer desires to call particular attention to the fact that in the advance of the science of assaying and chemical analysis, new schemes and "short cuts" of well-known methods are developed almost daily, especially by such efficient and progressive chemists as F. Andrews, F. D. Aller, A. E. Knorr, M. Heberlein and others, so that the best commercial methods of to-day may be "ancient history" a year hence. The methods described above, however, fully answer the requirements of the present time and are recommended for general adoption by all copper refinery chemists and assayers.

THE ANACONDA COAL WASHER, MONTANA.

The accompanying illustration is a view of the coal washery of the Anaconda Copper Mining Company, at its coal mines near Belt, Montana. The coal-washer system used in this plant is the Jeffrey-Robinson type, made by the Jeffrey Manufacturing Company of Columbus, Ohio. In this Anaconda plant three 400-ton washers are used, as indicated in the illustration. The coal is brought to these washers by means of chain conveyors which receive the coal from the screens. In washing, the coal is separated into three different sizes, each tub taking care of one size, while any one of them will handle the coal without sizing. The washed coal passes out at the overflow, as will be seen in the illustration, being run into a common carrier, which takes the coal from all three washers.

This Jeffrey-Robinson system replaced one of the more extensive systems formerly used by the Anaconda Company, and was adopted largely owing to its simplicity, and the fact that the cost of repairs is practically nothing, while the cost of washing is reduced to but a few cents per ton. In this system the refuse is withdrawn at the lower end of the washer while the good coal, being lighter in weight, passes off at the overflow. These three washers have a combined capacity of 1,200 tons of coal in 10 hours.



ANACONDA COAL WASHER, BELT, MONTANA.

It may be mentioned that before adopting the Jeffrey system this company sent a car of coal to the Jeffrey Company at Columbus, Ohio, for testing in their experimental washer, the test being made under the supervision of one of the Anaconda Company's engineers. The test proved so successful that the adoption of the Jeffrey system immediately followed, and the cut is a reproduction of part of the plant.

Briefly described, the Robinson washer consists of a cone-shaped tank with slate chamber at the lower or smaller end. Inside of this cone there are heavy projecting stirring blades which rotate. The water is forced into the washing tank from below, while the coal is fed in at the top. As the coal sinks into the washing tank, the lighter particles are carried up with the water, while the heavier particles drop below and are withdrawn through the refuse chambers. The water which passes off with the coal at the overflow is collected in settling tanks, from which it is again repumped and used over again and again.

THE EIGHTH INTERNATIONAL GEOLOGICAL CONGRESS.

The second circular of the committee having in charge the arrangements for the eighth International Geological Congress, which is to meet in Paris from the 16th to the 26th of August, 1900, has just been received. Membership in the Congress is open primarily to geologists, but may also be obtained by all persons who are interested in the applications of geology. The sessions will be held on alternate days, the intervening days being devoted to the Exposition, to the geological museums in the city, and to visiting places of geological and palæontological interest in and near Paris. The committee proposes to divide the sessions into four sections, as follows: 1. General and Technical Geology. 2. Stratigraphy and Palæontology. 3. Mineralogy and Petrography. 4. Economic Geology and Hydrography. The membership fee for the Congress has been raised to 20 fr. ($3.86).

The excursions offered by the committee are of two kinds: General, which are open to all members of the Congress; and special, which are reserved for specialists in the line of study which will be particularly illustrated by the region to be visited. Not more than 20 persons can be taken on each of these special excursions. According to a rule of the Council, adopted at St. Petersburg, a deposit of 20 fr. is required from each person inscribing himself for the excursions. This deposit is to be deducted from the total fee for the excursion made, but is forfeited by those who inscribe but do not take the excursion. Special rates are to be made for members of the Congress by the French railroad companies, and by certain hotels in Paris during the stay in that city. Eight "special" excursions are offered by the committee during the fortnight preceding the sessions of the Congress; eleven "general" excursions on the days intervening between the sessions in Paris; and four "general" and eleven "special" excursions after the sessions. These cover all the most important geological features of France. Those entitled to membership in the Congress can get application blanks and descriptive circulars of the excursions by addressing Prof. Charles Barrois, Secretaire general du comite d'organization du Congres, 62 Boulevard Saint Michel, Paris, France.

COMPOSITION OF THE FUME FROM MOLTEN SLAG IN LEAD SMELTING.

Written for the Engineering and Mining Journal by Malvern W. Iles.

As far back as 1880 I stated in the "Engineering and Mining Journal" the assay value of the fume which arises from the hot fluid slag which is tapped out from blast furnaces smelting argentiferous lead ores.

I then pointed out that I found gold in this fume, but was not then absolutely sure that gold would pass off in the fume state, and while it was then my firm conviction that such was the case, yet I suggested that such an occurrence might possibly be due to exceedingly fine particles of the matter, which invariably contains gold in amounts varying from 0.1 to 0.05 oz. per ton, as a resultant of attrition.

Recently, however, a very large and representative sample of this slag fume has been collected, which passed off from the top of a 60-ft. brick stack which conducted the fumes from the Iles patented slag settler. This fume was collected by withdrawing it from the 60-ft. stack (and 3 ft. from the very top) by means of a 3-in. pipe, which connected directly with a water motor. At the discharge end of the pipe there was connected a specially constructed heavy tin box, 3 ft. by 3 ft. by 5 ft., and at the top of this box there was attached a circular thimble, to which there was tied a flannel bag, 18 in. diameter when distended, and 10 ft. long. The fume so drawn from near the top of the stack in connection with the Iles slag settler was thus filtered through the meshes of the cloth, and the night and day attendant would from time to time shake the bag in accordance with the noticed resistance of pressure. By noting the revolutions of the motor and size of discharge, and by readings the aneomoneter, quantitative determinations were arrived at, showing the commercial losses per year. It is not the purpose of this article to state these commercial results, but only to point out the actual chemical composition of this fume; which, briefly stated, is as follows:

		Per cent.			Per cent.
Silica	(SiO_2)	1.70	Potassium as	(K_2O)	0.60
Iron as	(Fe_2O_3)	1.00	Sodium as	(Na_2O)	0.85
Zinc as	(ZnO)	21.00	Carbon	(C)	21.40
Sulphur as	(SO_2)	1.60	Lead as	PbS	14.04
Sulphur as	(SO_3)	9.75	Lead "	PbO	21.04
Lime	(CaO)	0.60	Ammonia	(NH_3)	distinct trace
Arsenic as	(As_2O_3)	0.18			
Alumina	(Al_2O_3)	1.20	Total		99.16

Careful experiments were instituted for the determination of barium, magnesium, antimony, cadmium, bismuth, phosphoric acid, titanic acid, chlorine, fluorine, and copper, but not even traces were discovered. The following results were obtained by a fire assay: Gold, trace; silver, 7.4 oz. per ton of 2,000 lbs.; lead, 30.2 per cent.

THE BOHEMIAN LIGNITE FIELD.—In the Bohemian brown coal field, which is traversed by the Aussig-Teplitz Railway, several new shafts are being sunk. The German-Austrian Mining Company of Dresden is sinking a shaft at Maria Ratschitz which is designed for an annual output of 300,000 tons. This shaft will, it is expected, be completed by the end of next year. The North Bohemian Coal Company is sinking a shaft 260m. deep also for an output of 300,000 tons. The Theresa Deep Mining Company is also sinking a shaft. Lastly, Mr. Ernest Abendroth has decided to put down a shaft at Karbitz.

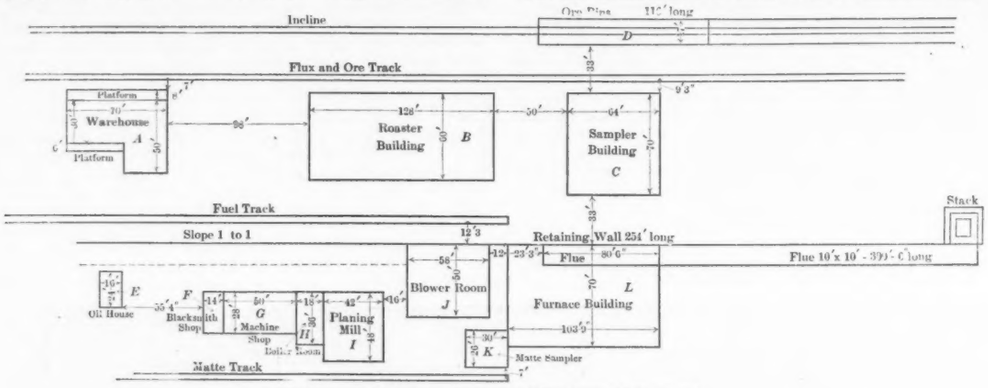
THE ELECTROLYTIC ALKALI COMPANY, LIMITED.—A company to produce alkali on the Hargreaves-Bird electrolytic process offered its shares to the public in London recently, lists opening on December 5th and closing on December 7th. The capital is £500,000, divided into 200,000 cumulative 7 per cent. preference shares and 300,000 ordinary shares, only one-half of each kind being offered for subscription now. The consideration to be paid to the parent company for the United Kingdom patents is £100,000, half being in fully paid-up shares. The remaining £200,000 of the present issue will be available for the purchase of land and erection of plant and buildings. The Hargreaves-Bird process was described in the "Engineering and Mining Journal," May 21st, 1898, page 611.

THE GRANBY SMELTER, BOUNDARY DISTRICT, BRITISH COLUMBIA.

Written for the Engineering and Mining Journal by Charles A. Bramble.

In the previous article—"Engineering and Mining Journal," December 9th, page 699—a general description was given of the Boundary District and its ores, and of the reasons which led the Granby Consolidated Smelter Company to locate its works on the North Fork of the Kettle River. Below is given a description of the plant which the company is erecting there.

A spur track, 2½ miles in length, with a very easy grade, runs from the main line a short distance above Columbia, to the north end of the works. The power house is within 1,000 ft. of the smelter buildings, and about 100 ft. below them. There is ample room at the smelter site proper for as large a plant as the company will ever care to put up, and there is ample dumping room for years to come. The main power with which the blowers, sampling works, etc., will be driven is to be given by a duplicate set of 16-in. turbine wheels, operating, as before mentioned, under an effective head of 45 ft. This will develop



PLAN OF GRANBY SMELTER, BRITISH COLUMBIA.

250 H.-P. net. These are mounted in pairs on horizontal shafts and are cased in a steel flume mounted on I beams. These wheels are connected with the flume by a steel intake pipe, 4 ft. 7 in. diameter, and discharging into a single draft chest and draft tube, 16 ft. long, set at 45° downward inclination.

The wheel used is the New American, made by the Dayton Globe Iron Works. One of the great advantages of this wheel is that it works at its greatest efficiency when the gates are three-quarters open. These two pairs of turbines are each directly connected with one Westinghouse rotating arm, alternating-current generator, having a capacity of 180 kilowatts, 250 volts, the full lode efficiency being 93.5 per cent. A section of the power house is shown in the accompanying drawing.

The foregoing description applies to the main power battery. During the day all will be in use, running at three-quarters capacity, but they are so arranged that one battery will run the works at night, hence giving an opportunity every evening to overhaul one battery. By this arrangement they are practically equal to duplicate engines. There will also be in the same power house a single 10-in. turbine wheel, developing 40 H.-P. net. This is directly connected with one Westinghouse 4-pole lighting generator of 22.5 kilowatts capacity, 125 volts. This is for lighting the entire plant, and is self-contained. Moreover, when the works are running, and it is necessary to shut down for repairs, or in case the large power battery is not running, the works would still be lit. It was considered better engineering to have the lighting plant separate from the power generator.

There will also be in the same power house one single 13-in. horizontal turbine wheel, which will develop 55 H.-P. This wheel is belted to a Stillwell-Bierce & Smith-Vaile Company triplex pump, of the double-action type, having a guaranteed capacity of 750,000 gallons each 24 hours, against a maximum pressure of 100 lbs. to the square inch, or against a 200-ft. head. This pump will furnish water and pressure to granulate the slag, as it runs continuously from the furnaces.

There is yet another battery in the power house equal to the first mentioned, namely 16-in. wheels, to supply extra power should such be required. The power house is 100 ft. long by 30 ft. wide, and all the batteries are set in line, on one long concrete foundation. The end of the flume enters at one end of the building, about 35 ft. above the center of the wheel, the water being tapped out of the side of the flume and thence conducted by various steel intake pipes to their respective water wheels.

The smelter proper consists of two double-decked, steel-jacketed furnaces, 160 by 44 in. The total height of the furnaces from the charge to the furnace floor is 14 ft. The jackets come within 18 in. of the charge floor. The heights of the lower set of jackets is 7 ft. 6 in., and that of the upper set 2 ft. 6 in. The furnace has a continuous flow water jacket and bronze slag spout. The tuyeres are 5 in. in diameter and 9 in number. The lower side of the furnace has 3 water jackets on the side and one on each end, while the upper jackets number two on the side and one on each end.

The bottom of the furnace is of the movable type, and the brickwork is supported by a cast-iron bed-plate, mounted on eight wheels, and is raised and lowered by 8 jack screws built in the wheel frames. The tuyeres are made of cast-iron at the furnace end, connecting with the blast pipe through 6-in. boiler tubes, which are joined to the cast-iron end by air tight expansion joints. All jackets are hung from the wrought-iron I beams, which are supported in turn by the cast-iron deck plates resting on the columns.

On each side, and in the center of the furnace, are small water-cooled tapping jackets, for tapping out when the furnace is blown out. The furnace, above the feed floor, is of brick, bound with suitable buckstays, and there is a charging door on each side of the furnace, opening the entire length, and about 2 ft. high.

The gases pass off from the top, in a 4-in. diameter down-take pipe, which is connected with the big flue-dust chamber leading to the stack. This pipe is fitted with a damper, and should anything go wrong in the flue chamber the gases can be led into the air by another pipe, 3 ft. in diameter, which passes up through the top of the building.

These furnaces should smelt from 150 to 250 tons each a day, the capacity depending, of course, on the character of the ore. The maximum capacity of the works will not exceed 500 tons a day, unless it should be decided to add two furnaces, something which may very probbly be done within a year or two. The furnaces are set in a building 70 by 104 ft., and are 39 ft. apart from center to center. This is exceptionally wide, but metallurgists are now building their furnaces much further apart than was their practice a few years ago.

The down-takes of the furnaces are connected with the big flue chamber, 10 by 10 ft. on the inside, and 300 ft. in length. The stack is 11 by 11 ft., inside measurement, and 150 ft. high.

The blower room is 50 by 58 ft., and is 12 ft. from the furnace building. It will contain 3 No. 8 Connersville blowers, one for each furnace, and one in reserve. These are connected with the furnaces by a 54-in. diameter blast pipe, all blowers being connected with the one main pipe. There is room in the building for another blower should the plant be increased. The blowers are special patterns, and each one has its own driving pulley, with one outboard bearing. Each of these blowers is driven by an 88-H.-P. variable-speed Westinghouse induction motor, which is belted directly to the blower. Two will be in constant operation and one in reserve.

The main sampler building is 64 by 70 ft., and is surrounded on three sides by ore bins. The ore train as it comes into the smelter will be carried by an incline to a series of receiving bins, parallel to the front of the sampling works, 23 ft. above the floor of the same, and 33 ft. distant. These receiving bins will have a total capacity of 1,000 tons. The bins are filled directly from the cars, which have a bottom dump. During the day the ore from the receiving bins is taken by small iron cars, which dump into a No. 5 Gates gyratory crusher. This crusher has its opening a little below the floor of the sampling works and crushes a ton at a time. After this rough crushing, which reduces the ore to lumps the size of a man's fist, it is elevated to the top of the building by a continuous steel bucket elevator. It is next sampled by the Snyder automatic sampler. The bulk of the ore is distributed to the bins on three sides of the sampling works by a special cast-iron spout. After being cut the sample passes to a 7 by 10-in. Blake crusher. Once more it is cut by a smaller Snyder sampler, from which the sample goes to a set of 10 by 18-in. economic rolls, which reduce it still further. One more cutting, by a smaller Snyder sampler, and the sample is delivered on steel plates, where it is again cut by hand, and then goes to a fine sample grinder.

It is intended that the matte shall be shipped after being brought up to 45 to 50 per cent. copper. For the present it will go to some eastern refinery. This shipping matte, after having been cooled, will be crushed by a 7 by 10-in. Blake crusher, which will be placed in one corner of the furnace building on the furnace floor. This crushed matte will be raised by an ordinary cup elevator to a special matte sampler. This matte sampler building is built on the corner of the furnace building and is 26 by 30 ft. The building is so arranged that the crushed matte can be sampled automatically or by hand. It has the same automatic arrangement as the ore sampler. The lower part of this building contains four bins, holding about one car of matte each, and it will contain the matte after it shall have been sampled. The gates by which the matte is drawn off are 2 ft. higher than a car floor and the shipping track is so arranged that the car door and the floor from which the matte is sacked are on the same level.

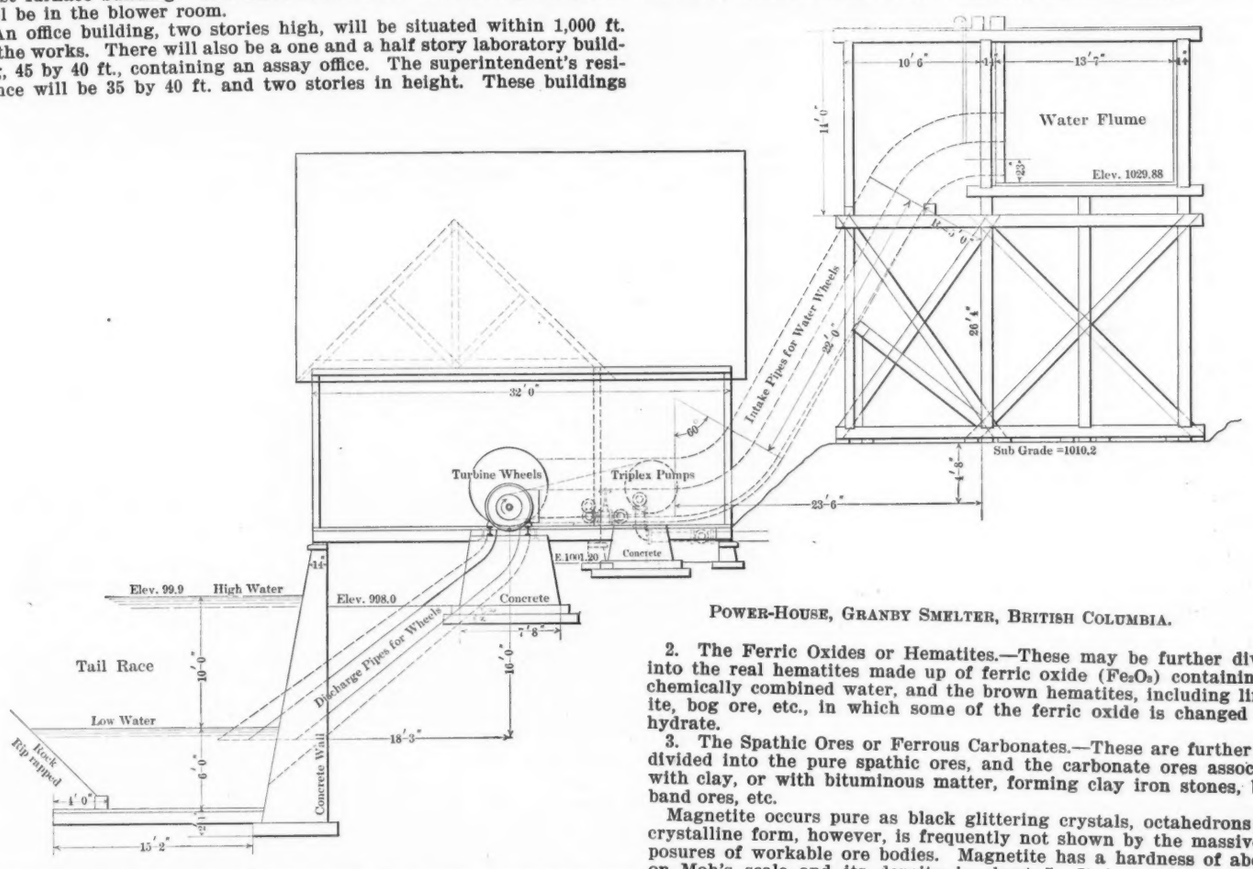
When the works are increased, in a year or two, it is proposed to put in a matte converting plant complete and to ship converted copper. Next spring a roasting plant, and, if deemed desirable, a briquette machine, will be installed. Plans have already been drawn up for a roasting building and briquette plant, 60 by 128 ft., but nothing will be done until it is known exactly what capacity will be needed. In any case roasters cannot be delivered for six months. For the present 50 per cent. of the ore will be roasted in piles.

The works will contain a carpenter shop and planing mill, 42 by 48 ft. The machine shop, 28 by 50 ft., will contain two lathes, drill press, planer, bolt cutter and pipe machine. There will also be a blacksmith

and repair shop, 28 by 40 ft., containing punch, shears, forges and steam hammer. A warehouse, 30 by 100 ft., where supplies can be loaded or unloaded directly from the cars, will be a great convenience, especially as it is the intention of the smelter company to furnish all supplies and do all the repairs for the several mines.

Behind the smelter, and at an elevation of about 120 ft. above the works, is a 100,000-gal. tank. This is supplied with water through an 8-in. steel riveted pipe extending from the pump to the power-house, a distance of about 2,000 ft. from the tank. This water is to be used principally for granulating the slag, as it runs continuously from the settler in front of the furnace. The slag and matte, as it flows, runs first into a water-jacket receiver, oval in shape, 5 by 4 ft. and 2 ft. deep. The matte is tapped from the receiver periodically, and is either taken to the matte sampler, to be shipped, or, if low-grade ore, is re-roasted and re-smelted. The slag, as it flows over the receiver, runs into a large settling pot, which, in turn, overflows into the slag launder, where it is granulated by the water which carries it to the dump. This large settling pot is placed in front of the receiver as a precaution to prevent the loss of matte should the receiver, through negligence, become too full. All the machinery in the various buildings is run by Westinghouse induction motors. There is a 75-H.-P. motor for the sampler, a 30-H.-P. motor for the matte sampler, a 15-H.-P. motor for the machine shop and a 10-H.-P. motor for the elevator in the main blast furnace building. The main switches for distributing the power will be in the blower room.

An office building, two stories high, will be situated within 1,000 ft. of the works. There will also be a one and a half story laboratory building, 45 by 40 ft., containing an assay office. The superintendent's residence will be 35 by 40 ft. and two stories in height. These buildings



POWER-HOUSE, GRANBY SMELTER, BRITISH COLUMBIA.

are to be very modern in style, with bath room and all conveniences, lighted by electricity and heated by a steam plant situated in the basement of the office building. The accompanying plan shows the arrangement of the buildings, including all but the office and laboratory.

The man who is directing the building of the Granby Smelter, and who will have full charge of it after it shall be running, is the well known American metallurgist, Mr. A. B. W. Hodges. He has been connected with the smelting industry since 1886. His first position was that of assistant superintendent of the Philadelphia Smelting and Refining Company, at Pueblo, Col. From there he went to Socorro, N. M., to take the position of superintendent of the Rio Grande Smelting Works, belonging to the National Lead Company. Later he became superintendent of the Compania Metalurgica Mexicana, at San Luis Potosi, Mex. Returning to the States, he accepted the superintendence of the St. Louis Smelting and Refining Works, at St. Louis, owned by the National Lead Company, and was eventually promoted to the management of the manufacturing department of the National Lead Company in New York. In addition to this experience, Mr. Hodges has done much valuable special work, reporting upon smelting works and examining prospective sites and enterprises.

Two hundred men are now pushing the smelter to completion, and it is hoped that it will be blown in some time next spring.

JAPANESE COAL FOR THE PHILIPPINES.—A report comes from the East that the Mitsu Bishi Company has concluded a contract with the United States Government to furnish a large quantity of Japanese coal for the use of war vessels and transports. Deliveries are to run over nine months and are to be made at Manila, or at other ports as directed.

SOME COMMON IRON ORES.

Iron is a widely distributed element and is an important constituent of the earth's crust, occurring in a great variety of combinations. In distribution and quantity it is the first of the distinctively metallic elements. It has, however, a decided affinity for oxygen and is an unstable element; consequently native iron is very rarely found. Still it was probably in the native form that this element was first used in an economic way by man. Many meteorites are made up mostly of native iron, and from meteorites primitive tribes are known to have fashioned implements. Iron also occurs native in certain lava flows, the most noted being in Greenland, and has been found in the shape of small nodules in certain stratified rocks.

Iron has a peculiar property of forming two oxides of different chemical quantivalence and this property assists greatly in the formation of ores. Of the ores used as sources of iron the oxides are by far most important, the next most numerous class being that in which the iron oxide is combined with carbon dioxide, forming iron carbonate. The ores may be classified under three general divisions.

1. The Ferrous Magnetic Oxides, or Magnetite (FeO, Fe_2O_3).—This class is further divided into the pure magnetites, and the magnetites in which part of the oxide of iron is replaced by the oxide of some other metal, as chromium, titanium or zinc, forming chrome iron ore or chromite, titaniferous iron ore, or ilmenite, and franklinite.

2. The Ferric Oxides or Hematites.—These may be further divided into the real hematites made up of ferric oxide (Fe_2O_3) containing no chemically combined water, and the brown hematites, including limonite, bog ore, etc., in which some of the ferric oxide is changed to a hydrate.

3. The Spathic Ores or Ferrous Carbonates.—These are further subdivided into the pure spathic ores, and the carbonate ores associated with clay, or with bituminous matter, forming clay iron stones, black band ores, etc.

Magnetite occurs pure as black glittering crystals, octahedrons; the crystalline form, however, is frequently not shown by the massive exposures of workable ore bodies. Magnetite has a hardness of about 6 on Moh's scale and its density is about 5. It is brittle, and when rubbed on a hard, slightly rough surface, gives a black streak. It is magnetic; this is its most striking characteristic and is easily detected by a pocket compass. When pure, magnetite contains 72.4 per cent. of iron, and is the richest of the iron ores. In this country, it is found in the Adirondack Region of New York State, in the highlands of northern New Jersey and southeastern New York, at Cranberry, N. C., at Cornwall, Pa., and about Republic, Champion and Michigamme, on the Marquette Range in Michigan. It is associated usually with rocks of great age which have been much changed by pressure and heat; generally those dating back to pre-Cambrian time. It occurs also associated with igneous rocks.

Magnetic ores frequently contain as impurities, particles of calcium phosphate or apatite, and also iron pyrites. Usually, magnetite contains, in the workable bodies, more than 10 per cent. of gangue matter, which is usually quartz or some silicious mineral. Particles of apatite can be removed after mining by magnetic concentration and the sulphur by roasting. Magnetites of the second class are far more abundant in this continent than true magnetite. Of these, the most prominent geologically, but of least value commercially, are the titaniferous iron ores. These contain titanium as an oxide (TiO_2). This element when the iron is smelted in the blast furnace lowers the fusibility of the slag, besides forming a curious titanium compound that accumulates in the hearth of the furnaces and interferes with its action. Consequently, all attempts to smelt titaniferous ores on a commercial scale have so far been unsuccessful. The ores usually occur associated with igneous rocks, often with gabbro, a dark green and often coarsely crystalline rock. In this country they occupy large areas in northern New York, and form immense exposures at the base of the great gabbro range on the north shore of Lake Superior. Titaniferous iron ores are

found also in Colorado and Wyoming. Though now unworkable, such ores have a potential value, as there is no reason to suppose that human ingenuity will not sometime make them available as a source of iron.

Chromite, another impure magnetite containing oxide of chromium, occurs like ilmenite associated with plainly igneous rocks or with rocks like serpentine of possibly igneous origin. It resembles magnetite very closely in appearance, hardness and density; but may be distinguished by the color of its streak or powder, which is brownish gray. It is smelted to produce chrome iron, which is used in making a tough, hard steel for special purposes. Chromite is also used in making a very refrectory brick for lining furnaces, as it fuses with difficulty. The salts of chromium, the chromates, are used as coloring matter in many pigments.

Franklinite, which closely resembles magnetite in appearance, occurs only at Franklin, N. J., in a very old crystalline limestone. The ferrous oxide in this mineral is replaced more or less by oxide of zinc, associated with manganese. The New Jersey Zinc Company, by a process of magnetic concentration, separates the franklinite crystals from those of other manganese or zinc minerals; then by roasting frees the chemically combined zinc. The iron-manganese residue is used in the manufacture of spiegeleisen.

The anhydrous ferric oxides of iron are called hematites because they give a red streak. The ore itself is frequently red; but not necessarily so. The specular ores, for instance, are bright, glittering, and almost black. The maximum hardness of hematite is about 6; and its greatest density about 5; but many varieties are soft and porous. The region about Lake Superior is our chief source of hematite, and the mines show all varieties of the ore. In some, the ore is very hard, tough and dense, as at Tower, Minn., on the Vermilion Range. On the Gogebic Range in many of the mines near Ironwood, and on the Menominee Range at Crystal Falls, Mich., the ore when mined often resembles a soft red mud. On the Mesabi Range, in Minnesota, the ores are frequently like a fine sand, with all shades of color, from red to black or dark blue. About Iron Mountain and Norway, Mich., on the Menominee Range proper, the ores look like a soft bluish shale, while at Republic, and other parts of the Marquette Range, the ore occurs in micaceous and specular forms. These specular and micaceous ores are often extremely pure, and sometimes rather beautiful in appearance. The crystals and scales are dark gray, and sometimes iridescent. At some of the Ishpeming, Mich., mines the so-called kidney ores occur. These often form masses made of concentric layers with smooth kidney-shaped surfaces and break with a conchoidal fracture.

Hematites are by far the most important sources of iron supply in North America, and are the foundation of the great iron and steel industry of Pennsylvania and the Middle West. They occur in rocks of almost any age, but generally in the older formations. All Lake Superior iron-bearing rocks probably date back to pre-Cambrian time, and many of them were possibly formed from sediments deposited on the bottom of an ocean in which no life yet existed. In the Eastern United States, the principal sources of hematite ore lies in the Clinton formation, limestones and shales of Silurian age, which outcrops over a vast area. Much of the area contains ore that is too low grade or in too thin beds to work. The New York and Pennsylvania beds, the so-called fossil ores, are and have been considerable sources of supply. Going south along the Appalachian Mountains across Central Pennsylvania, Maryland and Eastern West Virginia the ore beds thicken and in Southeastern Tennessee and Southwestern Virginia are of great importance. Finally in Alabama these Silurian ores are well developed and from their proximity to coal and limestone and the ease with which they can be worked, form the basis of the great iron industry that centers at Birmingham.

At Iron Mountain and Pilot Knob in Missouri specular hematites occur associated with volcanic rocks, porphyries and altered tuffs. This district was 25 years ago a very important source of supply, and the deposits were said to form mountains of ore and to be inexhaustible. The workable ores of Iron Mountain were in two beds in an altered tuff; those at Pilot Knob in veins in the porphyry. The mines were worked out and abandoned some years ago.

Pure hematite contains about 70 per cent. of metallic iron. Ore running over 66 per cent. in car load lots has been shipped from Lake Superior mines, notably the Lake Angeline at Ishpeming and the Republic at Republic, Mich., but the great bulk of the Lake Superior ores go nearer 60 per cent. The Clinton ores worked in New York and Pennsylvania run 40 to 44 per cent. The ores at Birmingham, Alabama, have gone as high as 55 per cent., but the present average is probably near 40. The Iron Mountain and Pilot Knob hematites ran from 58 to 65 per cent.

The hydrous hematites or limonites are light yellow to dark brown in color and give a brownish yellow streak. They are not crystalline, but are usually earthy, though the botryoidal form or kidney ore is very common. In hardness and density they do not differ much from hematite. The limonites are the most widely distributed of all the iron ores and occur in a great variety of rocks. The so-called bog ores—which are found where water containing iron in solution on exposure to the oxygen of the air precipitates the iron as sesqui oxide—are being formed in many lakes and swamps. Limonites formed from the oxidation of bodies of iron sulphide or the decay of ferruginous limestones may occur in formations of early geological time. The bog ores are unimportant in this country. They were worked in a small way in colonial days and are now smelted at a few localities in Canada. Limonites in rocks of Silurian and Devonian age occur in Blair County, Carbon County and Juaniata County, Pennsylvania, and in Virginia at Low Moor. In the Lake Superior region there are many bodies of limonite, some of large size, that have been neglected more or less in the search for the purer hematites. On both the Marquette and Menominee ranges are mines producing limonite, while on the Mesabi large amounts of limonite ore were thrown away as waste in stripping the high grade hematite bodies. Limonites also occur in Northeastern Iowa, at Santa Rita, New Mexico, in Saguache County, Colorado, and limonite ores are found in large amounts at Leadville, Colorado, and Tintic, Utah, in connection with lead-silver ores, and are used as a flux by the smelteries. The great sourse of limonites in the United States, however, is a belt of much altered limestones, slates and other probably sedimentary rocks of Cambrian or early Silurian age extending along the Appalachians from Vermont to Alabama. These ores were worked many years at points in Western Massachusetts and Connecticut and Southeastern New York, furnishing a highly valued foundry iron. The ores occur again in Lehigh County, Pa., and run southeast to Alabama, across Maryland and through the Shenandoah Valley, where they are well developed. In Eastern Tennessee, Northeastern Georgia and Northern Alabama these brown ores are developed on a large scale and furnish a good part of the supply of local furnaces. Pure limonites contain about 59 per cent. iron, but they usually contain more phosphorus and other undesirable impurities than the hematites. They generally run from 40 to 50 per cent. iron as mined, but often less. The Massachusetts and Connecticut ores ran from 45 to 50 per cent., the Pennsylvania ores have gone as high as 55 per cent., and the Alabama ores from 35 to 50 per cent.

Siderite or spathic iron ores are of considerable importance in this country. Pure siderite is of value chiefly as its occurrence throws light on the origin of iron ore bodies. Economically it is of almost no value. It contains 48 per cent. of iron. Its color is dirty white to brownish red, hardness 4, and density 3.8. It gives a white streak and has a well marked rhombohedral clearage.

Concretions of impure siderite are frequently imbedded in shales with much clay, forming the clay iron stones. Such ores are of great importance in England, but do not occur in sufficient quantities to be worked to any great extent in this country except at the Burden Mines at Hudson, N. Y.

Iron carbonates with some earthy and more or less bituminous matter, form the black band ores. These are usually associated with coal seams and are well developed in the carboniferous rocks of Kentucky, Ohio, West Virginia and Western Pennsylvania. The true black band ores are frequently associated with limonites and often with clay iron stone. The Jackson County, Ohio, and Hanging Rock, Kentucky, ores belong to this class.

The production of all kinds of iron ores in the United States in 1898 in round numbers was 20,800,000 tons. This production was divided among the different kinds of ore approximately as follows: Magnetites, 1,650,000 tons; red hematites, 16,600,000 tons; limonites, 2,350,000 tons; carbonate ores, 150,000 tons. The production of chrome iron ore was but 100 tons.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

"AVERAGE" TO BE TAKEN AS BASIS.—Under a contract for milling ores which provides that "said ores, rock and earth shall be worked in the usual and ordinary manner of working like ores, and returns therefrom shall not be less than 70 per cent. of the pulp assay," the return is for an average of 70 per cent., and not on each ton of ore furnished.—Fox vs. Mackay (57 Pacific Reporter, 673); Supreme Court of California.

ALLEGATIONS MUST BE DEFINITE IN CALIFORNIA.—A party contracted to mill ores furnished by another, and return 70 per cent. of the pulp assay. The latter sued for an accounting, alleging fraud and conspiracy, and that less than 70 per cent. was returned to him on a certain number of tons of ore furnished. There was no allegation that the 70 per cent. had reference to the pulp assay, or how much it fell short of 70 per cent., or when the ore was furnished. The court held that such complaint was insufficient.—Fox vs. Mackay (67 Pacific Reporter, 672); Supreme Court of California.

LIENS AND MINING PARTNERSHIPS IN IDAHO.—The law of mining partnerships, as declared by the courts, or by the statutes of Idaho, does not entitle a mining partner to a lien on the produce of a mine for his share of past products made by his partners while he was excluded from the property, as against a mortgagee of the interests of such partners, although he will be entitled to his share of the product while the mine is operated by a receiver appointed in a suit to foreclose the mortgage.—G. V. B. Mining Company vs. First National Bank (95 Federal Reporter, 36); United States Circuit Court of Appeals.

ESSENTIALS OF DESCRIPTION OF A "VEIN."—In order that a vein may be followed extralaterally, identity throughout is essential, and the vein must be continuous; but the continuity may be interrupted, provided the interruption does not prevent the tracing of the vein through the fissure as geologically identical. A charge by the court to a jury that veins are permanently separated, and cannot be followed as the same vein, when, in order to connect them, it is necessary to pass through a considerable distance of rock showing no elements of the vein, where there are neither minerals, walls nor seams, is proper, as being practically a charge that the jury must reach a certain conclusion as to the continuity of the vein. Where the court, in a charge, has correctly defined a vein, and indicated that, in order that a vein may be followed extralaterally, it must be the identical vein throughout, it is not erroneous to place stress on the physical continuity and to neglect to charge as fully in regard to the other elements of identity, when no charge is requested.—Butte & Boston Mining Company vs. Societe Anonyme Des Mines De Lexington (58 Pacific Reporter, 111); Supreme Court of Montana.

ABSTRACTS OF OFFICIAL REPORTS.

Palmarejo & Mexico Gold-Fields, Limited, Mexico.

The report of this company for the year ending June 30th, 1899, shows receipts as follows: From gold and silver bullion, £42,106; profit on stores in Mexico, £1,502; transfer fees, etc., £134; total, £44,742. The payments were: Charges in Mexico, £38,594; charges in London, £1,724; interest and exchange, £1,415; total, £41,733. This leaves a balance of £3,009 as profit for the year.

The directors' report says: "The company has been registered in Mexico, and has taken over from the liquidator of the Palmarejo Mining Company, Limited, the whole of that company's assets. The estates, mines, etc., so taken over have been registered in its name, also the mines, lands, etc., acquired from the Gold-Fields of Mexico, Limited, and known as Huruapa. The consideration for this latter property, which contains the whole of that company's assets, has been paid. Additional land adjoining the Huruapa Estate, containing a quantity of timber, having been offered your directors, they have acquired it, under the advice of the manager, at a comparatively small cost.

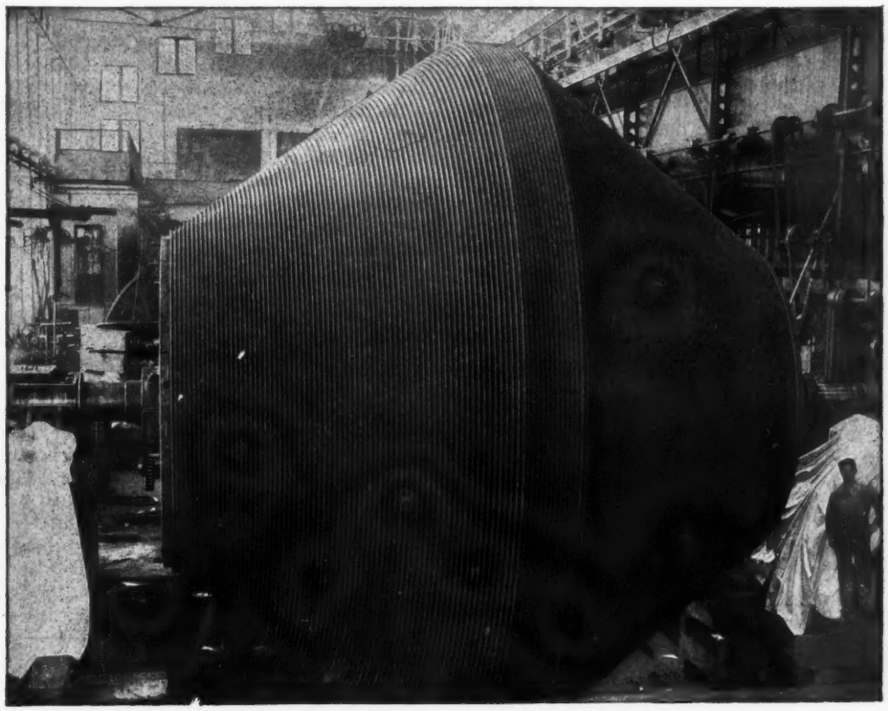
"In view of the opinions given at the formation of the company that the ore in the Palmarejo Mine was nearly exhausted, the directors were under some apprehension that the mill would have to be shut down. Fortunately, the ore in the mine has proved to be a much larger body than was anticipated. This fact, taken with the discovery that the Rosario dump was of value, has enabled the mill to be run to the present time, resulting in a profit for the year. The first ore taken from the dump gave promise that it alone could be worked at a profit, but on further working the quality fell off, which necessitated the manager falling back on the reserve of rich ore. This course became necessary by reason of the importance to the company of keeping the mill running and the company's large establishment and valuable staff together, pending fresh discoveries, and your directors are pleased to report that the manager in his last communication states that, apart from such discoveries, he will be able to keep the mill running for some months longer, although it must not be overlooked that the ore in the Palmarejo Mine is becoming exhausted and is consequently more expensive to work. The Rosario dump contains large quantities of low grade ore that can be utilized at very little cost, and on this, together with such better grade ore as the mine yields, the 50-stamp mill is being run.

"Shareholders will remember that Mr. Liddle, the late manager, strongly advised testing the ground below the Dios Padre Tunnel by means of diamond rock drills, consequently two were purchased, and boring has been progressing in the Dios Padre Tunnel in 5 holes at depths varying from 135 ft. to 441 ft. Up to the present, with the exception of some ore met with in Nos. 2 and 4 holes assaying 4.37 oz. silver and 5.83 oz. silver respectively, no promising ground has been discovered. Other portions of the Palmarejo Mine have been and are still being tested, but without success up to the present.

"A full supply of water has been conveyed to the mill by the conduit the greater part of the year, but owing to an exceptional shortage of water in the Chinipas River the supply passing through the conduit from April to June was much reduced, and caused loss to the company by interfering with milling operations. There have been two accidents during the year which were speedily repaired; a quantity of new flumes have been put in at considerable cost which has vastly improved the general condition.

"In place of ordering new iron stores, a foundry has been established in which old iron has been used and some 55 tons of castings for mill, railway, etc., have been turned out. The railway and rolling stock have been maintained in good order, a large number of new sleepers having been put in the road bed. The mill machinery has been maintained in good working order. New battery mortars have been ordered and are now in course of delivery. During the year there were crushed in the 50-stamp mill 18,540 tons, including salt and sulphurets, and 16,380 tons of pulp were panned, producing bullion valued at $389,783 silver and $24,099 gold, which realized in Mexican silver $432,553, equivalent to £43,255. The ore purchased and treated from mines, other than the company's, during the year consisted of 45 tons, assaying about $100 gold per ton, in two lots, and 40 tons of sulphide ores of an assay value of 42 oz. silver per ton. This was obtained from mines adjoining the company's La Patria Mine.

"From the reports of the manager and Mr. Nancarrow, it will be seen that the prospects of the company on the Huruapa property are most encouraging, especially having regard to its large area and the small amount of development work that has been done upon the different mines, and to the fact that active development work has only been proceeding since the spring of the year. The rich percentage of gold ores on this property, compared with those on the Palmarejo, is a feature of the highest importance. Particular attention is called to the development of La Esperanza Mine, and to Mr. Nancarrow's report 'that the ore assays 15 oz. silver, and $12 gold per ton.' His report on the other mines cannot be considered otherwise than as satisfactory and full of promise for the future success of the company. There are, in addition to those now reported on, a large number of mines which have not yet been fully prospected. The directors' instructions are to push on with the most promising, leaving the others to be dealt with as occasion and opportunity occur. The immense area of the Palmarejo Estate (about 60 square miles) must not be under-estimated, as, should new mines be discovered thereon, the value of the whole Estate would be immensely increased."



HOISTING DRUM FOR ATLANTIC MINE, MICHIGAN.

THE ATLANTIC MINE HOISTING DRUM.

The accompanying illustrations show a hoisting drum forming part of a hoist built by Fraser & Chalmers, Chicago, for the Atlantic Mine, Michigan. The capacity of the hoist is 6,000 lbs. ore raised at 3,400 ft. per minute, running in balance; the total load unbalanced being 22,000 lbs. The maximum depth is 4,000 ft. and the inclination of the shaft is 55° from the horizontal. This engine can be reversed by steam.

The engine is a duplex Corliss, non-condensing, having cylinders 24 in. diameter and 60 in. stroke. They are direct acting and are intended to take steam at 100 lbs. pressure. It is furnished with platform, indicators, etc., complete, and with a take-up drum for adjusting the length of the rope as it stretches.

The drum shown in the engraving is of double conical form, with a cylindrical portion in the center, wide enough to carry 12 coils. The large diameter in the center is 25 ft. 4 in., and the drum tapers off at each end to 12 ft. The total face is about 22 ft., and it is grooved for 1¼-in. rope. There are band brakes, one at each end of the drum; they are set by weight and released by steam. The drum is fixed on the shaft.

This drum was cast in 4 pieces, and these were afterwards split for convenience in shipping. The total weight of the drum is 280,000 lbs., finished.

QUESTIONS AND ANSWERS.

Queries addressed to this department should relate to matters within the special province of this periodical, such as mining, metallurgy, chemistry, geology, mineralogy, machinery, supplies, etc. As it is manifestly impossible to devote space to all the questions and notes constantly received, preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot here undertake to give professional advice on problems requiring special investigation and which should be obtained from a consulting expert. Nor can we undertake to give advice about mining companies or mining stocks. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers should send their names and addresses. Anonymous questions will not be answered. Preference will, of course, always be given to questions submitted by subscribers.—Editor E. & M. J.)

Raising Tailings.—I have to dispose of 100 to 150 tons of tailings from a stamp mill daily (24 hours). They have to be raised about 20 feet, in order to run off to the dump. Can you suggest the best way?—O. B.

Answer.—A sand wheel or tailings wheel is a very common device. This is a wheel of sufficient diameter, carrying buckets on its circumference, which dip the wet tailings up out of the pit or receiving pond and dump them on the race through which they are carried off. The Frenier & Le Blanc sand-pump—see "Engineering and Mining Journal," May 7th, 1898, page 553—is also a device which has done good work.

Sulphur in Coal.—Will washing reduce the sulphur in coal which is to be used for making coke?—S. T. R.

Answer.—As a rule, the proportion of sulphur in coal can be reduced by washing, especially where the coal is crushed before washing. In some recent experiments the sulphur in different samples of coal was reduced from 2.2 to 1.2 per cent., and from 2.1 to 1.0 per cent. by crushing and washing. In both cases the washed coal would make coke with less than 1 per cent. sulphur—the usual limit—while the unwashed coal would not do so. See "The Mineral Industry," Volume VII., page 764.

Hand Rock Drills.—Among the different hand rock drills made are there any really practical which have been used with good results? Can you advise me whether any will fulfill the conditions?—C. T.

Answer.—There are several hand rock drills on the market which are practical and useful tools for their special purposes. They have been proved by extensive use and have been successful. We cannot undertake to recommend any special tool; but there are several patterns, each of which has some special advantages of its own, all being good tools. You will find them by consulting our advertising columns.

Tappet Keys.—I find that iron tappet keys in use soon get burred upon the end, so much so that they have to be replaced by new ones, or taken out and shaped up. Either way takes time and costs money. Steel keys, as a rule are too hard, and do not take hold like iron.—N. G. T.

Answer.—A good plan is to use iron keys with a steel end forged on. The steel toe, it is claimed, will soon pay for the extra cost. Drill steel will answer the purpose. See "Engineering and Mining Journal," August 20th, 1898.

Manganese Ore.—I notice in your issue of November 25th that manganese ore, 50 per cent., is quoted at 22 cents per unit. I have a vein of manganese 4 ft. in width that is 62 per cent. manganese and only a slight trace of phosphorus. It also carries 1 per cent. nickel. Please inform me of some firm that is on the market for that class of ore.—C. E. B.

Answer.—Any of the large steel companies—such as the Carnegie Steel Company, the Federal Steel Company, the Republic Steel Company—will take good manganese ores. Consult the "Engineering and Mining Journal," November 4th, 1899, page 553, and September 30th, 1899, page 402; also "The Mineral Industry," Volume VII.

Tripolite or Infusorial Earth.—Will you kindly inform me through your valuable "Journal," as to the amount of tripolite or infusorial earth consumed in this country, and the purposes for which it is used? From what sections of the country does most of the product come? What is the specific gravity of pure tripolite?—L. H. F.

Answer.—The production of infusorial earth, also known as diatomaceous earth, in the United States in 1898, was 1,392 short tons. It was mined at Pope's Creek in Maryland; in Storey County, Nevada; at White Lake, in Herkimer County, New York. The variety known as tripoli is obtained from Newton County, Missouri, where 1,865 short tons were mined in 1898. Besides the places mentioned other large deposits are known, which are not at present worked.

It is used as an abrasive, as an absorbent, as a non-conductor of heat, in the making of building and refractory brick and in the preparation of water-glass. The material is chiefly—80 to 90 per cent.—silica.

The specific gravity of dry infusorial earth is about 0.25, excessive porosity being correlated with this low density. When saturated the density increases to about 1.25. Calcining increases the specific gravity about 50 per cent.

"Spanish Dip Needle Mineral Rods."—Are they of any practical value for tracing mineral veins? Do you know of any substance, or chemical combination of minerals or other substances that will attract gold or silver, in such a manner that it could be used as a guide in the search of those metals, in leads, or for hidden coins? Texas has more mineral rods than the balance of the world, I think; there seems to be a craze over them here—why, I know not. We have every kind here, from a bottle filled with mercury suspended by a string, up to those showing a high grade of workmanship. Most of the latter are bought in the East, some of them having a number of detachable needles, each said to be attracted by a certain metal. I have many inquiries about these needles, and have invariably condemned them. Am I right?—J. J. D.

Answer.—You are quite right in condemning the contrivances you mention. They are of no possible use, and can only deceive the purchasers. The magnetic needle has been frequently used in prospecting for deposits of magnetic iron ore, and has been of service, though its indications are not always reliable, especially in unskilled hands. In Sweden the needle is very much used, and the Swedish iron-men are often very skilful with it. For other metals, however, there is no known substance possessing a similar attraction to that of iron for the magnetic needle. A bottle of quicksilver could be of no possible use in indicating the presence of gold or silver ores. As to the instruments you mention with detachable needles, each attracted by a different metal, they are probably made in a showy way, "with intent to deceive" the purchasers. The best way is to let these things alone altogether and stick to the old and well-known ways of prospecting.

Cost of Agitating Ores.—Will you kindly give me information through your columns of the expense of agitating ores per hour in the chlorination process for extracting gold? What is the cost of agitating, say, 20-ton barrels per hour? What is the cost per hour per ton by other effective methods of extraction during agitation? Any references to the literature bearing on this subject will be appreciated.—J. S. N.

Answer.—It is a difficult matter to get at the actual cost of agitating ores in the chlorination process, as it is not usually kept separately. In barrel chlorination the cost would be that of the power required to rotate the barrel. This would depend on the size of the barrel, the weight and thickness of the pulp, and the speed or number of revolutions per minute. Probably for a 10-ton barrel this would be less than 1 horse-power; it would not make any considerable addition to the total cost of power in a plant. The owners of the Haile Mine in South Carolina have never consented to any publication of costs of working, which is to be regretted. While it is impossible to state the exact cost, it may be said that the agitation is only a minor factor in the total cost of chlorination.

In the same way it is not easy to give separately the cost of agitating sand or slimes in the vats in other leaching processes. The power required to stir up sands in a vat would be greater than that expended in revolving a barrel. In the Transvaal the total cost of cyaniding slimes, which have to be kept in motion continually during the leaching process, is from $1.25 to $1.50 a ton. If we consider the cost of cyanide, handling, precipitation and other items, it must be evident that the agitation is only a small amount.

The best articles we can refer you to on the subject of the chlorination of gold ores are the papers by John E. Rothwell in the "Engineering and Mining Journal," February 7th, 1891; "The Mineral Industry," Volume I, pages 233-238; and Volume V, pages 261-284.

PATENTS RELATING TO MINING AND METALLURGY.

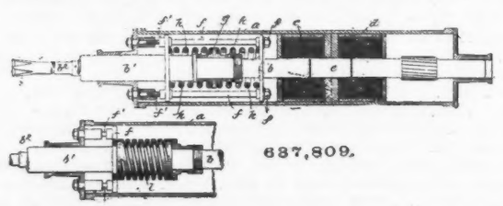
UNITED STATES.

The following is a list of the patents relating to mining and metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

Week Ending November 28th, 1898.

637,792. PROCESS OF DROP-FORGING. William R. Howe, Dayton, Ohio, assignor to Henry B. Haigh, New York, N. Y. The process of forming a dovetailed groove in metal by forging, which consists in first forming the groove with arched base and open flanges by swaging with suitable dies, and then simultaneously swaging the base and bending the flanges with suitable dies to form the groove.

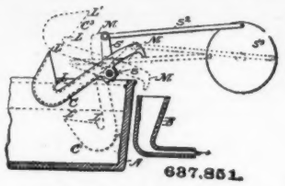
637,809. RECIPROCATING DRILL. Adolf E. W. Meissner, Charlottenburg, Germany, assignor to the Siemens & Halske Electric Company of America, Chicago, Ill. The combination with the casing, a drill-



637,809.

rod, and a collar removably held by threads on the latter; of a spring adjustably connected at one end to the casing and attached at its other end to said collar, and an electric motor devoid of springs and entirely independent of said spring for reciprocating the drill-rod.

637,851. LIQUID-FEED DEVICE FOR ELECTROLYTIC OR KINDRED APPARATUS. Henry Carmichael, Malden, Mass., assignor to S. D. Warren & Co., Boston, Mass. The combination of a reservoir, a pipe having an axis of rotative movement, a scoop end, a stem and a delivery opening, and so mounted with reference to the reservoir that the rotative movement of the pipe carries the scoop end below the level of liquid in the reservoir, the relative proportions of the scoop and stem parts of the pipe being such that the volume of con-

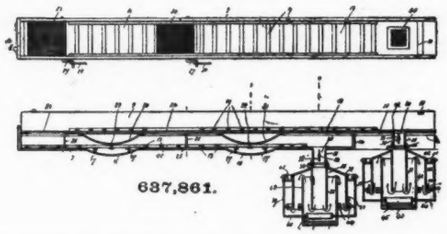


637,851.

tained liquid in the pipe at and after emersion from the liquid in the tank is at least equal to the volume of contained liquid in the pipe when the pipe is at that point in its rotative movement when the delivery-opening begins to spill.

637,856. APPARATUS FOR MANUFACTURING GAS. Levi S. Davis, Canisteo, N. Y. The combination of a generator and a fixing-chamber, an air-pipe communicating with the lower end of the generator and with a blower, an oil-supply pipe provided with a nozzle arranged centrally of the generating-chamber to direct a heated hydrocarbon vapor vertically through the chamber, and a measuring vessel communicating with the oil-supply pipe through a valve-controlled passage.

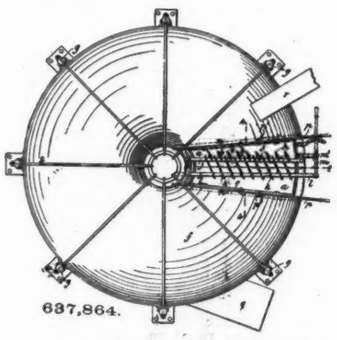
637,861. GOLD-WASHING APPARATUS. John H. Fellows, El Dorado, Kan., assignor of one-half to John W. Morrison, same place. A casing provided with a longitudinal perforated partition, the bottom of



637,861.

said casing being provided with receptacles having transverse baffles, and adapted to contain quicksilver, said partition being provided with transverse riffles and with deflectors adapted to operate in connection with said receptacles, and provided with transverse baffles.

637,864. CALCINING FURNACE. Joseph Godfrey and Henry J. Hayes, Swansea, England, assignors, by mesne assignments, to the Godfrey Calciner, Limited, London, England. The combination of a rotating bed, a fixed roof in the form of a segment of a circle,



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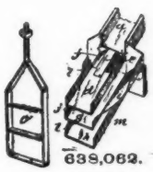


638,062.

leaving an opening in the roof, partitions along the radial sides of the opening in the roof, plows between the partitions below the opening, and means for rotating the bed beneath the plows.

637,935. BLOCK FOR BUILDING MOLES, DAMS, PIERS, ETC. Nicolaj R. Jeckel, Skagen, Denmark. A block for building moles, dams, piers and the like, formed of beton or like material, and having hooks projecting from its sides.

637,979. INCANDESCENT ELECTRIC LIGHT AND PROCESS OF MAKING SAME. William L. Voelker, London, England, assignor to Theron Clark Crawford, New York, N. Y. In the manufacture of filaments for incandescing electric lamps, the method of producing carbide of the earth metals uranium or thorium, consisting in taking two parts by weight of chemically-pure nitrate of the earth metal, and one part by weight of pure cane sugar, dissolving the same in a minimum quantity of distilled water and heating the solution in a suitable evaporating-dish to boiling point, then withdrawing the source of heat and allowing the mass to assume the condition at which spontaneous combustion takes place, and then, the evolution of nitrous fumes having ceased, and the resulting black porous mass having cooled, compressing the same into cakes of a size to fit the hearth of an electric furnace, and there reducing the same to a molten fluid by a large volume of current at a relatively low pressure.

637,983. REGULATOR FOR STEAM PUMPS. William A. Wood, Ansonia, Conn., assignor of one-half to the Coe Brass Manufacturing Company of Connecticut. A regulator for steam pumps, comprising an auxiliary pump actuated by a moving part of said steam pump, a fluid-reservoir, a water-pressure steam-regulator, and the interposed pipe system and check-valves.

638,001. WELL-TUBE LIFTING APPARATUS. Anton Bergerson, Chaseburg, Wis. A clutch comprising co-operating oppositely-located jaws, a bell-crank lever mounted upon one of the jaws and provided at the extremity of its long arm with a suspending device, and a link connecting the short arm of the lever with the other jaw.

638,005. APPARATUS FOR WASHING OR SCRUBBING GAS. Samuel Chandler, Jr., and Josiah Chandler, London, England, assignors to Kirkham, Hulett & Chandler, same place. An apparatus for washing or scrubbing gas wherein a series of circular plates, sheets or boards are carried upon an axle or shaft separating the said plates, sheets or boards by a series of distance-pieces arranged in circles or rows, with spaces between them, in such a manner that the distance-pieces of one row or circle are opposite to the spaces between the distance-pieces of the adjacent row or circle, so that the gas in passing from the center of the apparatus to the periphery will be caused to flow in a zigzag or circuitous course.

638,038. PRIMARY BATTERY. Henry Blumenberg, Jr., and Frederick C. Overbury, New York, N. Y. The combination with the battery-cell and its cover, of suspending-rods connected at their upper ends to the cover, a cup having side portions permanently secured to the suspending-rods and a separate bottom removable from the cup whereby the depolarizing material can be discharged downwardly by removing the bottom without disturbing the connections of the cup to the cover.

638,039. BATTERY COMPOUND. Henry Blumenberg, Jr., New York, N. Y. A battery compound of ammonium chloride and aluminum tersulphate, substantially as set forth.

638,040. BATTERY COMPOUND. Henry Blumenberg, Jr., New York, N. Y. A battery compound consisting of sulphate of aluminum and chlorate of sodium.

638,041. BATTERY COMPOUND. Henry Blumenberg, Jr., New York, N. Y. A battery compound of ammonium chloride and a bisulphate of the metals of the alkalies or alkali-earth metals.

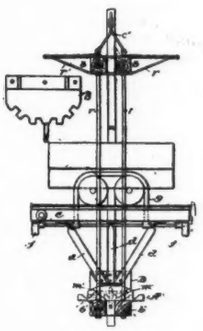
638,042. BATTERY COMPOUND. Henry Blumenberg, Jr., New York, N. Y. A compound for a battery solution consisting of a chloride of the metals of the alkalies or alkaline-earth metals and a bisulphate and a chlorate of the metals of the alkalies or alkaline-earth metals.

638,062. FEED-CHUTE FOR SEPARATORS FOR ORE, COAL, ETC. Frank Pardee, Hazleton, Pa. A feed-chute for spiral separators, comprising two inclined main chutes and a bridge-plate connecting the inner ends of said chutes and formed with a laterally-extending incline, and a lower chute arranged under the main chutes on a plane substantially parallel therewith, and formed with a laterally-projecting wing to receive and direct the material discharged from the lateral incline of the bridge-plate into the lower chute.

638,083. CHEMICAL GENERATOR OF ELECTRICITY. Edward L. Anderson, St. Louis, Mo. The combination of a pair of electrodes, one of which is lead, and a solution of hydrofluoric acid.

638,099. FURNACE FOR REDUCING ORES. Luis Correa, La Felguera, Spain. A gas-furnace, comprising a smelting-chamber, W, with a hearth, an air-heating chamber, N, next below the chamber, W, a fume-chamber, M, next below the chamber, N, and connecting with the smelting chamber and the fume-outlet, and a burner, K, open to the upper part of the smelting-chamber, said furnace having also an air-space above the smelting-chamber, air-flues connecting said space with the chamber, N, and a hot-air pipe, I, connecting said chamber, N, with the burner, K.

638,114. DUMPING CAGE. William G. Halbert, Westville, Ill. A tilting cage provided with a pivotal platform, that is sustained by toothed



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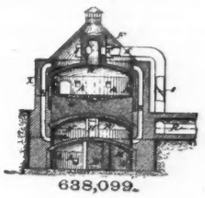

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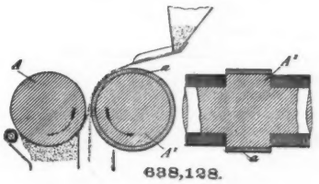


638,128.

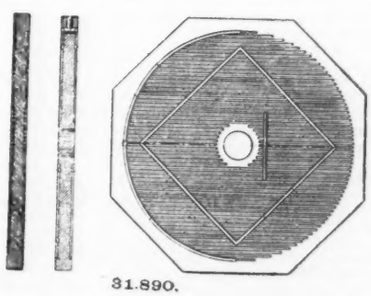
rocker members mounted on stationary toothed castings, said members being axially ranged relatively to said platform and provided with limiting stop-pins.

638,122. RETORT-DOOR AND MEANS FOR CLOSING SAME. John B. Houston, Vancouver, Canada, assignor to William H. Armstrong and Alexander Morrison, same place. In combination, a frame secured to the mouth of the vessel to be closed, a passageway for a door downward through said frame, and a flexible seat arranged around the opening to be closed and designed to receive the rim of the door, hand-levers having devices for drawing the door to its seat, and balance-levers for raising said door.

638,128 and 638,129. ELECTROMAGNETIC ORE-SEPARATOR. Emil Kreuser, Mechernich, Germany. In electromagnetic ore-separators consisting of a pair of oppositely-revolving cylindrical electromagnets, the combination with the polar surfaces of the one electromagnet of a closely-fitting covering of non-magnetizable material, whereby the poles of this magnet are prevented from attracting the ore, while at the same time they co-operate in producing the necessary flux of magnetic lines of force, and also serve to convey the ore to and from the magnetic field.

638,161. FURNACE FOR BURNING PULVERIZED FUEL OR THE LIKE. John B. Archer, Oakland, Cal. A furnace, comprising a fire-box having its side walls provided with a series of horizontal, obliquely-arranged perforations, a series of cylindrical projections supported in said fire-box and graduated in height from the front upward to the rear of said fire-box, said projections being provided with longitudinal bores, means for introducing fuel to said fire-box in a powdered or pulverized state, and means for forcing a current of air through the perforations and projections.

Design No. 31,890. FILTER-PRESS PLATE. John H. Hinken and John



31,890.

E. Turney, Louisville, Ky., assignors to the Turney Drier Company, Chicago, Ill. Design for a filter-press plate as shown.

PERSONAL.

Mr. J. P. Mills, mining engineer of Butte, Mont., is now at Altos Pinos, N. M.

Mr. J. Elliott, a mining man of Nelson, B. C., is spending the winter in Southern California.

Mr. George H. Ellis of Chicago has been examining a mine in Colorado for Chicago people.

Mr. Cyrus Osborne Baker, Jr., of Baker & Company, platinum buyers and refiners of Newark, N. J., has been in California.

Mr. C. E. Watson of Carson, Nev., has been appointed superintendent of the Almono Mining Company in Antelope Valley, Mono County, Cal.

Mr. L. C. Du Bois of Turret, Colo., has accepted the position of superintendent of the Crown Point & Virginia Mine near Central City, Colo.

Mr. R. N. Dickman, of Dickman & Mackenzie, Chicago, Ill., is now in Cuba, where he has gone in the interest of New York men, to examine iron mines.

Mr. Wm. H. Edgar, president of the Dearborn Drug and Chemical Company, has returned to Chicago, after a business trip to the West, including the Sandwich Islands.

Mr. James McGregor, for many years connected with the Crescent Mine at Park City, expects to go to Bayhorse, Idaho, where he will look after the property of the Salmon River Mining Company, in which he is the principal stockholder.

Mr. F. M. Grammar, who was formerly with the Duquesne furnaces of the Carnegie Steel Company, and with the Lackawanna Iron and Steel Company at Lebanon, Pa., has resigned to take charge of the blast furnaces of the Colorado Fuel and Iron Company at Pueblo, Colo.

Mr. William Weston, of Cripple Creek, Colo., has just examined the Haseltine group of mines in Gilpin County, the control of which is owned in Scotland. He has undertaken to reorganize the company. He is going to White Hills, Ariz., where he is manager of the White Hill Mining and Milling Company. He has been appointed consulting engineer to the Lillie Gold Mining Company of London.

OBITUARY.

Capt. John M. Imboden, son of General Imboden and part owner of the Monserrate Mine, Guscaran, Honduras, is reported to have been killed recently with William Gold, also a mining man, by a drunken native at San Pedro Aula, Honduras. Capt. Imboden fought through the Civil War, but has resided in Honduras. He was the recipient of many favors and mining concessions at the hands of former President Bogran.

P. F. Sellheim, for 7 years Under-Secretary of Mines for Queensland, died at Brisbane October 11th. He belonged to an Austrian family, but went to Brisbane in 1855. In 1874 he joined the Government service, and was appointed warden of the newly discovered Palmer goldfield. In 1880 he was transferred to the charge of the Charters Towers gold field, where he remained for 8 years, until a similar appointment was conferred on him at Gympie. In 1892 he accepted the Under-Secretaryship of Mines.

M. A. Bucke, general manager of the Bear Gulch Mining Company at Jardine, Park County, Mont., was instantly killed in a runaway accident on December 8th. He was driving from Jardine to Cinnabar, to take the train to Helena, when the team became frightened and ran away, and the occupants of the buggy jumped for their lives. Mr. Bucke struck head first and was instantly killed. He was from London, Ont., and in the operations at Jardine represented a large amount of English capital.

Col. Julius Walker Adams, one of the first engineers who conceived the idea of building the New York and Brooklyn Bridge, died at his home in Brooklyn, N. Y., December 13th, at the age of 87. He was born in Boston, Mass., and was a cousin of President John Quincy Adams. He left the West Point Military Academy before graduating to become the Assistant Engineer of the Stonington & Providence Railroad. He acquired the title of Colonel while at the head of the Hawkins Zouaves during the civil war.

He was consulting engineer in the construction of a Hudson River railroad bridge in 1865, and the designs for the East River Bridge were submitted to him in 1867. During the early period of the big span's construction Col. Adams held various positions in connection with it. For several years he was Consulting Engineer of the Board of City Works, Brooklyn, and also as to the distribution of water in New York City. He found time, too, to edit the "Engineering News," and had previously held an editorial position on "Appleton's Magazine." Col. Adams was the last surviving member of the 12 founders of the American Society of Engineers. He was a member of the New York Academy of Science and of the Association for the Advancement of Science.

SOCIETIES AND TECHNICAL SCHOOLS.

Cornell University.—The total number of students registered in all departments is 2,240 as against 2,038 at this time last year. A corresponding increase in the faculty brings the number of teachers up from 281 last year to 314 this year. Just about one-half the enrollment is from New York State. Forty-three other States and 14 foreign countries are represented in the other half of the student body.

Engineers' Society of St. Paul.—At the regular meeting on December 4th, 9 members and 1 visitor were present. Mr. W. A. Truesdell was named to prepare a memorial to a late fellow member, Archibald Johnson, deceased October 3d, 1899.

Mr. A. W. Münster read a paper on the "Temporary Bridge Across the Mississippi River at Wabasha Street," which paper he was requested to prepare for publication.

Capt. A. O. Powell presented a diagram and explained results obtained with silica cement, which is being used in the construction of the U. S. Government lock and dam No. 2 at St. Paul. Interesting discussions on lumber and cement occupied considerable time.

Engineers' Club of Philadelphia.—At the meeting on December 2d, 49 members and visitors were present. Messrs. Washington Devereux, William Fowden, Frank Furness and J. Wilmer Henszey were elected to active membership, and Mr. Howard M. Ingham was elected to junior membership.

Mr. Chas. Hewitt treated of the "Motorman as a Factor in Street Railway Economy." He exhibited on the blackboard and described a series of results of tests made to determine the effect produced by the motorman's method of operating a trolley car upon the economy of power consumed, which tended to show that by differences in the method of operating the controller, especially in starting the car, a difference of nearly 20% could be effected in the total power consumption.

This subject was discussed by Messrs. Carl Hering, Edgar Marburg, Harry K. Myers, W. C. Furber, A. B. Eddowes and others.

Mr. Thomas G. Janvier and Dr. Henry Leffmann called the attention of the meeting to some prophecies which had appeared in the current press regarding the improvements in certain applications of engineering which would probably occur in the future.

INDUSTRIAL NOTES.

The Illinois Car and Equipment Company is about to increase its plant at Hegewisch, Ill., to include a department for the manufacture of steel cars.

The Statler-Bischoff Company, manufacturer of steel tubing, of Chicago, has gone into the manufacture of tubing for mining and electrical purposes.

The Aetna Powder Company of Chicago reports a very large business with mining companies. The company is now enlarging its plant in Indiana.

The Witte Iron Works Company, manufacturer of gas and gasoline engines, Kansas City, Mo., reports steady sales of gas engines and a good demand from mining companies.

The H. A. Newkirk Company of Chicago, manufacturer of the Wood steam stamp, reports considerable inquiry for these mills, and from mines that have mills in service good reports are received.

The American Steam Pump Company of Battle Creek, Mich., states that its business, as compared with 1898, will show an increase of 60%. The company is now sending to foreign countries nearly 50% of its product.

The new refining plant of the Illinois Smelting and Refining Company at Chicago, Ill., is nearly completed. The new refinery will more than double the capacity. It is understood that the refining of zinc ores will be a specialty.

Work on the Weston General Company's plant at Newark, N. J., is progressing. The plant will cover 12 acres. Mr. Edward Weston is technical expert, and Mr. J. O. Matthieson president. The plant will have every facility for turning out heavy electrical machinery.

The Cook Locomotive and Machine Works recently shipped to the Barry Railway Company, England, a tank engine. The same works have also sent the Port Talbot Railway and Docks Company, 2 similar engines. These engines weigh in working order 75 tons each.

The Berlin Iron Bridge Company, of East Berlin, Conn., is about to complete for the American Ordnance Company, of Bridgeport, Conn., a new machine shop, with traveling cranes, runways, etc. The building will be covered with the Berlin Iron Bridge Company patent anti-condensation corrugated iron roof covering.

The Illinois Steel Company proposes to enlarge its Milwaukee plant, making of it one of the largest architectural iron and steel mills in the world. Eight new mills are planned, which will cost something like $3,000,000. An armor plate plant is talked of in connection with this Bay View plant.

There has been put upon the market by John Taylor & Company of San Francisco a hydrocarbon burner for using coal-oil or gasoline as fuel in crucible and muffle work by assayers. The advantage of this burner comes from the greater safety of coal oil which can be procured in all parts of the world.

The Chicago Cement Coating Company has opened offices in the Monadnock Building, Chicago. It is a branch of the Johnson Cement Coating Company of New York. This Company will push the business of the Johnson Cement Coating, a water and frost proof paint used for exterior and interior rough brick walls, etc. Mr. C. E. Schauffler is general manager of the Chicago office.

The crank and fly wheel plant is for the Penobscot Mine in Minnesota, 2 pumps with a capacity of 7,000 gals. per minute. The pumping station will be cut at a depth of 310 ft., and this will be the head against which the vast amount of water will be delivered. It will take two 19-in. by 35-in. by 36-in. cross compound Corliss engines to run these pumps and the plant will contain many mechanical refinements.

The Edward P. Allis Company has completed the shipment of machinery for a 300-ton concentrator, to be erected by the Sulphur Mines Company of Virginia, near Mineral City. The machinery consists of Reliance special heavy 30-in. by 14-in. rolls, Dodge crushers, automatic feeders, Hartz jigs complete, perforated metal screens, mechanically operated conveyor dryer, hydraulic sizers, Reynolds' Corliss engine, etc. The plant is designed to reduce and separate iron pyrites.

The Aultman & Taylor Manufacturing Company, Hansfield, O., will manufacture the 39,000 H. P. boilers recently ordered of Thayer & Company, of New York, for the New York Gas, Light, Heat and Power Company's new plant. Foreign orders show a big increase over last year. Some boilers were recently shipped for the power station of the first electric light plant in Corea. Other export boiler contracts include equipments for the Sao Paulo Electric Light and Power Company, of Sao Paulo, Brazil; the De Beers Diamond Mines, South Africa; the Havana Electric Railway Company; several iron and steel plants in the Midland districts of England, and the Shanghai municipal water works.

The Fred. M. Prescott Steam Pump Company of Milwaukee, Wis., mine pump builders, is constructing some of the largest mine pumping engines ever built, and claims the distinction of having recently received contracts for the largest single order for pumps of the direct acting type, as well as for the largest crank and flywheel type, ever let in America for underground installation.

For the Aurora Mine, near Ironwood, Mich., belonging to the Carnegie interests, the firm is building 2 large 6-cylinder triple expansion pumps of the direct acting type, which will have a capacity to deliver 2,000 gals. of water per minute when located 1,100 ft. underground, and to pump the water to surface in one lift.

The Atlantic Iron & Steel Company was incorporated at Trenton, N. J., December 7th, with a capital of $10,000,000, of which one-half is preferred stock, with 7% non-cumulative dividends. The company is authorized to mine, produce and manufacture iron and steel. The incorporators are: Charles A. Porter, Kennedy Crossan, L. S. Filbert, William C. Martin, John P. Peddler, all of Camden. It was originally intended to capitalize the company at $20,000,000, and to acquire the New Haven Iron & Steel Company, the Susquehanna Iron & Steel Company, the Danville Bessemer Steel Company and the Birdsboro Iron & Steel Company. The latter two companies, however, it is understood, have now dropped out of the deal, though the Danville Company may, it is intimated, be taken over later. The plan of the new company has been assented to by a majority of the stockholders of the New Haven Iron & Steel Company and the Susquehanna Iron & Steel Company. The company is reported to have bought the large property of the Chestnut Hill Iron and Rolling Mill Company, situated at Columbia, Pa. It is also reported that the company will erect a large mill, to cost from $750,000 to $900,000, which will manufacture all sizes of wrought iron pipe and will employ about 1,000 men.

TRADE CATALOGUES.

The firm of John Taylor & Company of San Francisco, Cal., publishes a 234-page catalogue of assayers' materials. Prices of all kinds of chemical apparatus are given, including balances, crucibles, blow pipes and furnaces, assayers' outfits, including hand crushers, stamp mills and experimental cyanide plants, also mill materials and supplies.

The A. Lietz Company of San Francisco, Cal., is sending out circulars calling attention to the surveyors' and engineers' instruments it carries in stock. The "Star" steel tape is stated to be a cheap but accurate and durable tape, and is furnished 100 ft., 50 ft. or 25 ft. long. A nandy pocket instrument for mining men is Attwood's mining clinometer. It weighs but 8 oz., and can be used for reconnoisance work, giving, it is stated, results as accurate as can be expected from a pocket instrument.

An interesting treatise on water tube boilers is published by Solignac, Grille & Company of Paris. It is a large 56-page pamphlet with numerous cuts and diagrams setting forth the general principles governing the generation of steam in water tube boilers and describing the peculiar points of merit of the Solignac boilers. These boilers are stated to be free from any danger of serious results from a broken tube, they can be set up quickly, are very economical of fuel, make dry steam, and the tubes can be easily cleaned. The boilers are made in all types —portable, stationary, marine and locomotive, the portable type having some special features of interest.

The Wolf safety lamp for colliery use is described at length in a 19-page pamphlet issued by the Fidelity International Agency, S. J. Oettinger, manager, of New York City. The pamphlet contains a reprint of a paper read before the Central Mining Institute of Western Pennsylvania. The Wolf lamp has been adopted by many foreign collieries and is in use at a number of mines in Pennsylvania. It uses naphtha as an illuminant, this naphtha being absorbed by cotton wool to prevent the possibility of leakage. The lamp can be unlocked only by using a powerful magnet, thus rendering any tampering by the miner very difficult. It can be relit and the flame can be regulated from the outside. The flame is protected by a double thickness of wire gauze.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying and selling goods of any kind.

GENERAL MINING NEWS.

Oil Exports.—In November the United States exported 13,958,267 gals. crude; 1,910,422 gals. naphthas; 58,813,977 gals. illuminating; 6,624,284 gals. lubricating and paraffin; 1,034,922 gals. residuum; total, 82,341,872 gals., against 76,007,690 gals. in November, 1898. For the 11 months the exports aggregated 883,696,488 gals., showing a decrease of 36,914,073 gals. as compared with the corresponding period last year.

CALIFORNIA.

Amador County.

(From Our Special Correspondent.)

Central Eureka.—A milling test of 357 tons of ore from this mine at Sutter Creek is completed at the Zeila Mill. The average is said to be $100 per ton. The shaft is down 1,640 ft., 200 of which is in the ledge. Arrangements are being made for a milling and hoisting plant in the spring. W. R. Thomas is superintendent.

Manuel Santirfo Gravel Mine.—This claim, situated 2 miles north from Pine Grove, at the head of Santa Clara Gulch, is being worked under the management of R. A. Watkins, who is to erect a 10-stamp mill to crush the cement or lava formation, and put in 2 giants with 8 and 11 in. pipes.

Oneida.—The new shaft has reached a depth of 2,100 ft., and sinking continues. The site for the new mill has been graded and work on the building will soon begin. The work of cleaning out the old shaft progresses rapidly.

Calaveras County.

(From Our Special Correspondent.)

Baumhogger.—The 10-stamp mill at this mine, ½ mile north of Altaville, is crushing ore from the Coleman Mine. At this mine the shaft is down 600 ft. Thirty-five men are employed.

Big Bonanza.—At this mine south of Angels, the shaft is down 300 ft. and some very rich ore has been cut in the east vein. This vein it is believed will merge into the west ledge. A mill is contemplated.

Bruner.—The shaft at this mine is now down 500 ft. and crosscutting has begun. The ore is good grade.

Ford.—Some high grade ore has been found in crosscutting on the 100 ft. level of this mine, ½ mile east from San Andreas. The average width is 9 in. Crosscutting is going on, on the 300 and 700 ft. levels.

Ford.—The 1,200 ft. shaft at this mine, 12 miles southeast from San Andreas, has been pumped out down to the 1,000 ft. level.

Union.—This copper mine at Copperopolis has been pumped out down to the 5th level, leaving about 400 ft.

Utica-Stickles.—Work at these mines at Angels has started up again with a full force of men. Work is also going on in the Cross shaft, and the Madison and Gold Cliff mines are running. At the Harrison Mine, 1¼ miles from Angels, crosscutting still continues and the ore body recently discovered still holds out. Thirty-five men are employed at the Fox Mine, the ore being milled at the Baumhogger Mill.

Kern County.

(From Our Special Correspondent.)

Black Hawk.—Wells are being sunk near this mine, 3 miles southeast from Randsburg, and if enough water is obtained the milling plant will be increased to 10 stamps. The cyanide plant at Cuddaback Lake is being moved to the property. There are about 1,500 tons of tailings there now. The capacity of the plant is about 15 tons per day.

Napa County.

California Quicksilver Mines Company.—This company has been incorporated in West Virginia with $750,000 capital stock, par $5, and with these officers: President, Henry E. Pearson of Boston; secretary and treasurer, R. A. Atwood of Boston; general manager, B. I. Potter of San Francisco, and in addition the following as directors: T. O. Potter of Denver, George E. Atwood of Boston and George E. Tyler of Hollister, Cal. The company owns 1,294 acres, on which 4 quicksilver mines are being operated.

Riverside County.

(From Our Special Correspondent.)

Bulwer.—This mine, situated between the Washington and the Milkmaid mines, about 4 miles from French Gulch, is producing some extremely rich ore from a 16 in. vein.

Hillside.—The shaft at this mine southwest from Perris, is down 120 ft. Considerable ore is on the dump.

Pit River Iron Claims.—W. C. Bruson and others representing Eastern capitalists have located over 200 claims near the Pit River Iron mines, which are held under bond by the same parties.

Spread Eagle.—This group of 22 claims, between the Balakalala and Stowell groups, west from Copley, in Flat Creek District, is reported to be bonded to the Scotch-American Development company for 1 year. Price, $150,000. The property has been opened up by about 1,000 ft. of tunnels.

Washington.—The production of this mine, 4 miles northwest from French Gulch, is said to be $3,000 per month. Twenty leasers are at work. Some of the ore is shipped to the Selby and Keswick smelters, and some is milled at the mine. The Niagara, 5 miles west from French Gulch, is also worked by leasers with good results.

Sierra County.

(From Our Special Correspondent.)

Magnolia.—At this drift mine between Goodyear's Bar and Forest, the channel has been cut and gravel which will go from $5 to $7 per car is being taken out.

Siskiyou County.

(From Our Special Correspondent.)

Commodore.—This property, at the head of Barkhouse Creek, 13 miles northeast from Scott Bar, is still yielding good returns under the management of E. M. Wilkinson. The present milling plant is to be replaced by an entire new mill. The ledge which is 2 ft. wide is worked by two tunnels on the vein. Work is being carried on in the extension.

Fort Gough.—This old hydraulic mine on Klamath River, 5 miles below Seiad, has been purchased by W. A. Bantz, who is associated with Boston men. The water to work the giant is obtained from Gough Creek, through a 3-foot ditch 1½ miles long. The gravel is 30 ft. deep.

Gold Run.—This property on Know Nothing Creek, 8 miles south of Forks of Salmon, has been developed to a depth of 1,300 ft. by tunnels. The plant consists of an air compressor, drills and a 10-stamp mill, the latter to be increased. The Dannenbrink Brothers are owners and managers.

Horn.—This hydraulic mine on the Salmon River, owned by the Bennett Brothers, has been bonded by G. W. Carson of San Francisco. A saw mill is to be erected, and teh mine put in working order.

Yreka Creek Dredging and Mining Company.—The timber and other materials for the construction of the new dredger to be built in Yreka Creek at Hawkinsville is beginning to arrive, and the work of opening a deep pit to bedrock is progressing rapidly. Twenty men and 12 teams are employed.

Trinity County.

(From Our Special Correspondent.)

Chloride-Bailey.—These mines on Canyon Creek, about 3 miles northeast from Dedrick, are producing some good ore. The free milling ore is said to pay the expenses, and the sulphurets are shipped to the smelter at Keswick. Twenty men are employed.

Pennsylvania Tunnel Company.—After an idleness of 5 years, this tunnel has been resumed. The machinery was overhauled and 2 drills are working. The company will drift on 4 of the veins that were cut prior to 1895. One of these has been opened near the surface and a shaft sunk 200 ft. disclosed about 6 ft. of concentrating ore. The drift on this vein will be extended under the International shaft.

COLORADO.

Hinsdale County.

Golden Fleece.—The new mill at this mine near Lake City is completed. A compressor is to be put in and work on the tunnel will be pushed by air drills.

Lake County.

(From Our Special Correspondent.)

Banker Mining Company.—Manager John Guth has returned from New York City. It is intimated that the plant is to be enlarged and prospecting carried on more extensively. The company has done a great deal of work without opening up any leading ore body, although it has very good indications.

Diamond.—The new shaft house is completed. The shaft in Big Evans, northeast of the Dollie B., will be sunk 1,000 ft. if necessary to catch the rich Dollie B. shoot. Denver and Eastern people are interested.

Fortune Group.—The Fortune and Penfield claims have been transferred to a New York syndicate which proposes to thoroughly develop the ore bodies and increase production. It is said that the purchase price was $100,000. The ground is well located on Little Ellen Hill and has a 700-ft. shaft showing ore which assays $7 gold, 20 oz. silver and 20% lead to the ton.

Mahala Mining Company.—This property, which closed down December 1st, passed into the hands of S. W. Mudd, manager of the Small Hopes group, in satisfaction of a judgment for $22,000 obtained by Mr. Mudd and the American National Bank. The parties concerned say the transfer is only temporary and a settlement will be made.

Niles-Augusta.—Geo. F. Campion is shipping 50 tons per day. The ore channel at 250 ft. depth is exposed for several hundred feet and is 40 ft. thick and 70 ft. wide, of fine silver-iron. Much ore is blocked out.

Nubian Mining Company.—The company in its Midland shaft below the Weldon has struck a rich seam of yellow carbonate at 475 ft. The vein shows 4 ft. thick and assays 40 to 200 oz. silver to the ton. Arrangements are being made to ship and another new shaft is to be sunk about 400 ft. below the present shaft.

Penn Mining and Leasing Company.—From 75 to 100 tons of good grade ore are shipped daily.

President.—The lease on this property has been sold to C. T. Carnahan and Eben Smith, who will sink a new shaft at the south end of the claim to catch the rich shoot worked in the Ballard claim.

St. Louis Tunnel.—August Zobel, on the north side of Breece Hill, at 150 in a winze 450 ft. in the tunnel, believes he has encountered the old Colorado Prince vein. Bucket samples show 18 oz. gold and 40 oz. silver to the ton.

San Miguel County.

(From Our Special Correspondent.)

Nellie.—This mine, near Telluride, has closed down for the winter. Manager E. I. Field has discharged 35 men. Several contacts for development work have been let.

Smuggler-Union Mining Company.—This company's 200-ton milling plant is expected to be running between January 1st and 15th. It is about 200 yds. southeast of the old mill, which treats from 175 to 200 tons in 24 hours, and will continue running. The 2 mills will handle about 400 tons daily. The mines and old mill will be closed soon after December 15th to make preparations for an increased output. The mining force, now numbering about 225 men, will be largely increased.

Teller County—Cripple Creek.

Pikes Peak Power Company.—This company has sent out invitations to the press and mining engineers generally to be present at an explosion at the site of its proposed dam on West Beaver Creek. The stream flows through a narrow chasm in granite, and about 40,000 cu. yds. of granite are expected to be dislodged at the explosion. The dam will be of rubble work with a steel face.

(From Our Special Correspondent.)

Blue Bell Mining, Milling and Prospecting Company.—At the annual meeting of the stockholders the following directors were elected: W. A. Otis, Charles Walden, William Barber, John McConaghy and William P. Sargent. Mr. Otis was chosen president, Mr. Barber vice-president, Mr. Sargent secretary and treasurer, and Mr. McConaghy manager. It is reported that considerable development work will be done on the property on Guyot and Gold Hills.

Findley Gold Mining Company.—At the annual meeting the following directors were elected: G. R. Buckman, Sherwood Aldrich, W. A. Otis, H. M. Blackmer, G. E. Lindley, A. T. Jones, and E. A. Richards. Considerable ore was produced during the year. The company owns the Findley Claim adjoining the Hull City placer.

Jack Pot Mining Company.—The hearing in the injunction suit brought against this company by the Doctor people was held in the district court before Judge Stimson. The restraining order, which has been in force about a month, was continued until after the case is tried on its merits. A number of prominent engineers are on the case.

Mary Cashen Mining Company.—This company, recently organized, has bought the 4½ acres of the Mt. Rosa placer from the Mary Cashen Gold Mining Company, that the latter have secured from the Mt. Rosa Company. The Mary Cashen Gold Mining Company took up the bond on the ground and turned it over to the Mary Cashen Mining Company. The latter company has also bought the Spicer and Spicer Extension claims in Victor, paying in the neighborhood of $50,000, making a total of about $150,000 paid out for property. It now owns about 10 acres of ground between the Strong and Gold Coin. The officers of the company are: J. P. Pomeroy, president; B. P. Wagner, vice-president. and Clarence Edsall, secretary and treasurer.

Mt. Rosa Mining and Milling Company.—This company's $40,000 dividend is from the proceeds of the sale of the ground to the Mary Cashen Gold Mining Company, and is to be paid about the end of the month. The company has still $73,000 in the treasury. It is one of the companies controlled by the Woods Investment Company.

Orphan Bell.—This company's dividend of $82,900 was derived from the sale of property. The company now only owns the Phenix, a fractional claim on Bull Hill. It is understood that the company has some money still left in the treasury.

Pharmacist Consolidated Mining Company.—At the annual meeting the following directors were elected: James F. Burns, president; Dr. Graham, vice-president; C. N. Miller, secretary and treasurer; A. E. Carleton and A. E. Jones are also members of the board of directors. The property is worked by several lessees and some ore is shipped. The company recently absorbed the old Pharmacist Company and owns the same ground.

GEORGIA.

Lumpkin County.

Chicago & New South Gold Mining Company.—This company has been organized by Chicago people, the incorporators being Dr. T. R. Cravens, R. S. Disney, C. S. Pierce, H. L. Irwin, W. L. Wallen, F. A. Cummings, Dr. John Blair, Alderman Albert Keeney, Dr. Herald, Samuel Olin, Frederick W. Hill and M. Bartels. The company is negotiating for the purchase of the Briar Patch property near Dahlonega and a 10-stamp mill.

IDAHO.

Blaine County.

Aetna Mining Company.—The ore in the 60-ft. winze in the tunnel level of the Aetna claim near Hailey is reported to show 5 ft. of good ore in places. A few men are to push development during the winter. J. W. Burton is president and A. W. Olson secretary. Both live in Salt Lake City.

White Knob Copper Company.—This company's property at Houston is owned largely by John W. Mackay of New York City and Col. Matthews of Philadelphia. The deepest workings are down 700 ft. The ores are reported to average from 3 to 4% copper. A new furnace may be built in the spring, though the present plant has made but one short run recently. Wayne Darlington of Antelope is manager.

Latah County.

Syndicate.—This company, that has been opening a claim at Kendrick, failed recently.

Shoshone County.

All the Federal troops have now left Wardner and only one company of State militia is quartered there. The men held prisoners have mostly drifted to Butte or British Columbia.

Evolution.—A good strike of lead-silver ore is reported on this claim near Wallace, owned by Mr. Prichard of Murray.

MICHIGAN.

Copper.

Copper Range Railroad.—Trains are now running regularly from Houghton to Winona.

Tamarack Mining Company.—The company has let a contract to Heughens & Hall to cut timber on the company's property south of Houghton. The timber cut will be 4,000,000 to 5,000,000 ft. yearly.

Iron—Marquette Range.

East New York.—Mining at this Ishpeming mine is going on at the second and third levels. Over 50 men are at work under Capt. Platto.

Michigamme.—At this mine at Michigamme the new steel stack at the boiler house is up and the boilers are in position. The foundation for the new crusher is ready. The compressor has been repaired. Prescott sinking pumps will be used to unwater the mine. It is stated that the Cleveland Cliff Company, which now owns the property, will not try to use the old magnetic concentrator which was running when the mine closed 7 years ago.

West Republic.—This old mine near Republic is being put in shape by the Republic Iron Company. Hoisting will be done from the Ely engine house ½ mile distant. The new shaft house at the West Republic is about completed. About 350 men are now on the rolls of the Republic Iron Company under Superintendent Morgan.

Bay County.

It is stated that a number of salt work about Bay City have been obliged to stop work on account of the short supply and consequent high price of coal.

MINNESOTA.

(From Our Special Correspondent.)

The ore roads have ceased shipments for the year, and there yet remain in dock only what ore can be easily sent forward the next week or so. All docks but those of the Duluth & Iron Range road are empty. Shipments for the years as as follows, by ranges, roads and mines:

Mesabi Range.

Duluth, Missabe & Northern Road:		
Adams	720,474	
Biwabik	553,336	
Commodore	152,946	
Day	1,975	
Duluth	166,435	
Franklin	60,000	
Hartley (Rust)	61,037	
Hibbing (Hull and Burt)	81,285	
Mountain Iron	1,137,970	
Ohio	293,651	
Pillsbury	106,488	
Sellers	174,867	
		3,510,964
Duluth & Iron Range Road:		
Auburn	384,176	
Canton	99,498	
Fayal	1,059,187	
Elba	9,155	
Genoa	275,189	
Hale	18,806	
Kanawha	14,963	
Malta (East Sparta)	28,614	
Roberts	57,393	
Sparta	237,142	
Vega (Cloquet)	1,620	
Williams, estimated	12,000	
		2,197,745
Eastern Minnesota Road:		
Mahoning	747,700	
Sauntry	55,500	
Penobscot	86,560	
		889,760
Total		6,598,469

Vermillion Range.

Duluth & Iron Range Road:		
Chandler	807,330	
Minnesota	453,087	
Pioneer	339,896	
Savoy	81,022	
Sibley	5,168	
Zenith	79,322	
		1,765,825

The Duluth blast furnace is steadily working on an all-Mesabi mixture, composed of about 300 tons of Williams, and the balance near-by ore.

Iron—Mesabi Range.

(From Our Special Correspondent.)

Mountain Iron's record of shipments for the year, 1,137,970 gross tons, surpasses that of any iron mine on the globe. The mine could have easily exceeded this total.

American Mining Company.—At the Sountry Mine a shovel started stripping May 15th, only test pits having been sunk before. In May about 5,000 yds. of earth were moved, but since then 225,000 yds. have been taken off, and nearly 4 miles of track laid. About 225 men are working and the company estimates 60,000,000 tons of ore in sight. One shovel, day shifts only, mined 15,000 tons in the first 6 days of mining.

Diamond Mining Company.—This company has purchased a steam pump and will complete its unwatering at once. The mine has a small crew at work now. Titles have been looked up of late, and it is reported in the interest of the Oliver Company. This is not true, but a Cleveland concern has an option on the prospect.

Hartley Explorations.—These explorations have opened a large body of hard ore, of an unusual character for the Mesabi Range, in section 23, T. 58, R. 20. It is expected these lands will ultimately go to the Oliver Iron Mining Company.

Capt. H. Roberts, who had an option on 4 forties of the Clark Iron Company lands in section 28, T. 58, R. 20, has sold his option rights on the northerly 2 forties, the south ½ of the northwest ¼, to the American Mining Company for $38,000. There is a royalty to the Clark Iron Company of 25c. a ton. Roberts had shown up some 4,000,000 tons. He retains the remaining 120 acres and is exploring them.

Iron—Vermilion Range.

(From Our Special Correspondent.)

Pioneer Iron Company.—The company has put electric motors on its stock-pile trestles. The electric system both underground and on surface is working well. The mine is sinking its new shaft 1,300 ft. south of the old, close to Chandler. It will make the mine a very large shipper. A surface system of water works is installed.

Reports from the many explorations now under way in T. 62, R. 14, T. 61, R. 15, and T. 62, R. 13, do not indicate general success. Many drills show nothing.

Roy Explorations.—These lands have been taken under option for lease by the Mahoning Ore and Steel Company, on a 25c. royalty and a 70,000 ton minimum. Work is already under way with drills. The property is south of Tower.

Alworth Development Company.—Exploration on the shores of White Iron Lake, east from Ely, are discontinued, nothing having been found.

Chandler Iron Company.—The Company has under option a fractional piece of land adjoining the Zenith and Pioneer on the north and between them and the lake at Ely. Zenith's drifts are said to touch the property. The company will explore at once, and is to pay a royalty of 40c. a ton and mine a minimum of 100,000 tons a year. This is the highest royalty since the new revival of mining, though common in the old days. Chandler has also taken and will explore a number of other pieces east, west and south of its original mine.

MISSOURI.

Jasper County.

(From Our Special Correspondent.)

Joplin Ore Market.—The market has been stronger, with a decided advance in prices. The best grades of fancy ore brought $34 per ton, as against $32.50 last week, while lead was steady at $27 per 1,000 lbs. The Eagle Mine at Belleville and the Conqueror in Chitwood Hollow sold at $34 and a large amount of ore sold from $32 per ton to $33.50.

During the corresponding week last year, top grade zinc ore was selling at $35 per ton and lead was selling at $20.50 per 1,000 lbs. The turn-in was less than for the week just closed by 4,838,110 lbs. of zinc and 574,480 lbs. of lead, and the value was less by $86,197. For the corresponding 49 weeks of last year the lead sales were greater by 5,286,958 lbs. But the zinc sales were less by 60,504,870 lbs. and the value was less by $3,813,176.

As compared with the preceding week, the lead sales were less by 81,650 lbs., but the zinc sales were greater by 387,150 lbs. and the value was greater by $15,195. Following is the turn-in by camps:

	Zinc, lbs.	Lead, lbs.	Values
Joplin	1,950,820	366,840	$40,978
Carterville	1,759,020	272,330	34,178
Webb City	799,530	37,980	12,618
Oronogo	1,646,210	...	25,118
Belleville	346 680	7,620	6,046
Central City	257,320	27,600	4 669
Duenweg	249,720	37,920	4,520
Stotts City	160 070	...	2,441
Cave Springs	117,660	.....	1,794
South Jackson	80,000	41,340	2,336
Galena–Empire	2,731,940	214,640	46,772
Barry County	77,570	.....	853
Dade County	114,450	..	1,259
Morgan County	86,980	45,680	2,229
Alba	82,800	.....	1,325
Hells Neck	235,940	.....	3,775
Aurora	1,582,000	22,050	21,395
Granby	382,000	10,000	5,200
Lehigh	102,290	.....	1,585
District total	12,750,800	1,084,000	$279,091
Total for 49 weeks	481,534,980	45,614,858	$10,323,321

Mining Land Sales.—The transactions were light, but one conveyed the fee of 37½ acres at Hell's Neck from the Ball Land and Mining Company to W. A. Rule, of Kansas City, for $125,000. The White Ribbon Mine at Carterville, largely owned by Helen M. Gougar, the orator of Lafayette, Ind., has been sold to John D. Cameron of Joplin as trustee for Eastern parties for $50,000. The Boqua Mine and 4 lots on the Norton land just west of Joplin have been sold

to J. W. Grounds of Carthage and Ira Miller of Westfield, Mass., for $30,000. A 2/3 interest in the New Drop Mine at Oronogo has been sold for $67,770. This is one of the greatest producers in the district. The Thayer & Chandler properties in Chitwood Hollow, west of Joplin, have been sold to the United Zinc Companies for $100,000. The properties sold included the Cock Robin, Pelican and Chicago Consolidated mines, with 2 large mills.

New Corporations.—The Roberta Mining Company, operating 40 acres south of Carterville, has incorporated with a capital stock of $25,000. The Lane Land and Mining Company of Sedalia, capital stock, $2,000. Lead Cave Mining Company of Kansas City, capital stock, $250,000. Incorporators: H. H. Hammond, G. E. Spraker, C. W. Clapp, J. B. Hamner and James H. Milburn, all of Kansas City, Mo. The North Shore Mining Company of Illinois, capital $12,000; offices at Joplin. Jubilee Mining Company of Illinois, capital, $8,000; offices and mines at Joplin. The Helena Zinc and Lead Mining Company of Joplin; capital, $200,000; incorporators, W. W. Gregg, Joplin; W. H. Cleminshaw, J. F. Kilfoyland, C. W. Somers, Cleveland, O., and J. J. McPherson and L. P. Cunningham of Joplin. The Manila Mining Company, Neosho, Mo.; incorporators, R. L. & C. F. Winter, F. S. Hammond, G. W. Scott, J. S. McDaniell, all of Kansas City; G. W. Signor, Shrevesport, La., and J. Pickens, Neosho, Mo. Ohio Mining Company; offices, Joplin; capital stock, $10,000. Helma Zinc Company, capital stock, $100,000; incorporators, Frank H. Coyne, East Orange, N. J.; Walter F. Baker, of Boston; James Virden, Denver, Colo. Big Four Zinc and Lead Mining Company, capital, $50,000; incorporators, J. T. Richards, J. L. Frazier and E. E. Dupes, all of Chicago. Boston-Philadelphia Zinc and Lead Company, Portland, Me.; incorporators, E. B. Loring and S. Pearce of Boston, Mass.; G. H. Thayer, Braintree, Mass.; H. L. Cram and Leroy L. Hight of Portland, Me. Middlesex Mining Company, Portland, Me.; capital, $300,000; incorporators, F. A. Smith, West Medford, Mass.; F. E. Houghton, Boston; L. N. Picher, Joplin, Mo.; T. L. Talbot and W. R. Anthoine, Portland, Me. Tan Yard Hollow Lead and Zinc Company, capital, $100,000; incorporators, W. I. Rush, H. C. Goddard, and H. Mills, all of Joplin. Industrial Zinc Mining Company, Kansas City; capital, $100,000; incorporators, A. F. Nathan, O. S. Bowman, J. W. Young, H. A. Wilson, A. F. Nathan, Jr., all of Kansas City. John Weir Lead and Zinc Company, principal offices, Jersey City, N. J.; capital, $100,000; incorporators, John Weir, Frederic F. Culver, and Arthur B. Townsend, all of New York City, and Louis F. Dodd of Montclair, N. J. Missouri-Arkansas Zinc and Lead Company, Kansas City, Mo.; capital, $1,000,000; incorporators, C. H. Kirshner, G. C. Misher, J. H. Cunn, Miss E. S. Mosher, E. C. Smith and T. Remley, all of Kansas City, Mo. The Boston & Jasper County Zinc Mining Company, Boston, Mass.; incorporators, C. H. Rollins, L. C. Benton, I. R. Jones, L. B. Fletcher and H. Radcliffe, all of Boston, Mass.

MONTANA.

Deer Lodge County.

Gold Coin.—This mine has closed down indefinitely. Poor management is given as a reason.

Madison County.

Grubstake.—This gold mine at Red Bluff has resumed work. It has produced considerable free gold, but has lain idle 4 or 5 years on account of litigation.

Red Bluff.—At this mine at Red Bluff, owned by a Montreal company, with George D. Turner manager, a large station pump will soon be installed. It is stated that a concentrating plant will be built next spring.

Silver Bow County.

There is great activity at the mines about Butte. The old wood gallows frames on Butte Hill are being replaced by steel structures and new hoisting engines are being installed. The leading mines are adopting self-dumping skips for hoisting ore and compressed air locomotives are coming into use to haul the ore from the shaft to the ore bins.

Below the High Ore Mine, 4 concerns are saving copper from the mine water by separation. The West Colusa is increasing the number of its precipitating vats.

Adirondack.—At this claim just east of the Tycoon some patent medicine men who have leased the claim are sinking a 300-ft. shaft. They are said to have struck a 6-ft. seam of good copper ore.

Anaconda Copper Company.—According to the Anaconda "Standard," the company's electrolytic refinery at Anaconda contains 1,400 tanks, 600 in the old part and 800 in the new. The new part is equipped with travelling cranes to handle the anodes and cathodes. The capacity of the refinery is 125 tons of copper daily and the output is said to approach that figure. About 100 men are employed under Superintendent F. Wilkinson. The boiler and engine plant is called the finest in Montana. There are 10 sets of Heine water tube boilers and 4 sets of Elephant boilers, the latter from the Union Iron Works of San Francisco, giving a total of 4,000-H. P. There are 6 engines, 1 1,000-H. P. Harris Corliss, 2 900-H. P. triple expansion Union Iron Works engines, and 3 450-H. P. Westinghouse engines. There are 9 dynamos of which 2 are always held in reserve.

Butte & Boston.—The company is building a new trestle and an elevator to carry its tailings to Silver Bow Creek.

Cora.—At this mine, east of Walkerville and outside of what has been considered the copper belt, about 20 leases are working. On the 600-ft. level F. Aug. Heinze is reported to be taking out ore that goes 40 oz. silver, $8 gold and 3% copper.

Snow Ball.—This claim 1 mile northeast of the Tycoon is being worked for a Boston company under the direction of George Savage.

Speculator.—At this Butte Mine the foundation of the steel gallows frame is completed and the structural steel is arriving. The new 1,000 ft. shaft is down over 500 ft. About 150 tons of ore are hoisted daily. According to reports, the mine now belongs to the Anaconda Company.

Tycoon.—This claim lies north of the Speculator and is under lease to James Cummings and T. J. McKenzie of Anaconda. An incline shaft is down 150 ft. and is to go 150 ft. farther.

NEVADA.

Storey County—Comstock Lode.

Consolidated California & Virginia.—From recent reports and statements it seems probable that a pocket of ore of some value has been found, but the extent is entirely a matter of conjecture. If we judge by other recent developments, it is not large. It is in a section of the mine which was abandoned some years ago on account of a fire, but is now being reopened.

Mexican Mining Company.—At the annual meeting in San Francisco last week the following directors were re-elected: Charles H. Fish, Charles Hirshfeld, H. Zadig, Nat T. Messer and G. C. Sneider. Charles H. Fish was elected president, Charles Hirshfeld vice-president, Charles E. Elliot secretary and G. McM. Ross superintendent.

NEW HAMPSHIRE.

Orange County.

Ely.—These old copper mines at Copperfield are reported sold to George Westinghouse of Pittsburg, Pa. The mines were large producers in 1880, but closed down in 1883. They were sold by a receiver in 1888 to Otto C. Krause of New York City, who organized the Copperfield Mining Company that expended a large sum of money in improvements. In 1896 the Ely-Copperfield Mining Company was organized by Boston, New York and Vermont men. but dissensions caused a shut-down in 1897. Since then F. W. Farnham of Copperfield has had charge and some good ore has been exposed in the mine, and a new furnace that takes the raw ore from the mine is reported to have given good results on experimental runs.

NEW YORK.

Dutchess County.

Colonial Iron Ore Company.—This company has been incorporated to work the iron ore beds near Sharon Station, on the Harlem Division of the New York Central & Hudson River Railroad. These deposits have been worked at different times, supplying ore to the charcoal furnaces of the region. Work is now in progress at Sharon, and a complete plant is to be put up to turn out 200 tons of ore a day. The company's main office is in the Havemeyer Building, New York. The officers are: Earle C. Bacon, president; Stanley K. Greene, secretary; Philip S. Swain, general manager.

OREGON.

Josephine County.

McCroskey & Mills recently sold their placer mine, on Upper Grave Creek, to C. E. Smith and others, of Colorado Springs. This property contains 50 acres of good ground, with equipment.

H. S. Woodcock sold recently to Erasmus Wilson and B. E. Meredith of Kansas City, Mo., a group of 5 claims on Josephine Creek, comprising 100 acres of mining ground. The sale included all water rights. The consideration was $11,000.

PENNSYLVANIA.

Anthracite Coal.

Girard.—At this colliery at Mount Carmel 300 miners who had struck returned to work last week, after obtaining their demand for the semi-monthly pay-day, and the same price for supplies as charged at the collieries of the Philadelphia & Reading Coal and Iron Company.

Susquehanna Coal Company.—The strike at the company's Nanticoke colliery virtually collapsed on December 10th, when the miners voted to accept the schedule and propositions submitted by the company a week before.

Slate.

(From Our Special Correspondent.)

Bangor Star Slate Company.—This company, of Bangor, Pa., has as incorporators G. W. Mackey, David Stoddard and George Stoddard of Bangor, and Harry A. Mackey and Albert Harris of Philadelphia. The company will work the Bangor-Superior Quarry, which it recently purchased at sheriff's sale for $200, subject to a mortgage of $19,000.

Chapman Slate Company.—During November this company, at Chapman Quarries, shipped about 2,200 squares of roofing slate, the largest amount of slate ever shipped from this quarry in one month so late in the season.

Imperial Slate Company.—A meeting of the stockholders, whose quarry and works are located at Wind Gap, was held at Stroudsburg, November 20th. The company was reorganized, new capital was put in, and it was decided to work the quarry and factory next spring. The quarry has been shut down over 6 months.

York County.

A fine bed of iron ore is reported found near Menges Mills on the farm of Samuel H. Bechtel of Hanover.

SOUTH DAKOTA.

Custer County.

(From Our Special Correspondent.)

Mica Shipments.—Two companies are shipping mica from the mines on French Creek, 4 and 7 miles below Custer—the Chicago Mica Company and the St. Louis Mica Company, under the management of Charles Harback, of Custer. The blocks of mica are cut to about 4 by 4 in. and some as large as 6 by 6 in. The cutting is done at the mines and at Custer.

Willow Creek Mining Company.—This company is retimbering the shaft and lower workings of the Lizzie Mine, east of Custer. Two drifts have been run south and west at the 275 ft. level. South drift is in a 4 ft. vein of silicious ore. West vein is in quartz carrying iron pyrites, with low value in gold.

Lawrence County.

(From Our Special Correspondent.)

Hardin Companies.—Two shifts are working in the original Hardin Mine, in Two Bits. The Hardins are still working on their smelter, to be erected at Redwater.

Spanish R.—The owners of this group of claims, 1 mile north of Ironsides, the Connors Brothers, of Spearfish, are retimbering the 320 ft. shaft. S. R. Thompson, of Deadwood, formerly superintendent of the Iron Hill Mine, will be mine superintendent. It has been a good producer.

Pennington County.

(From Our Special Correspondent.)

Cochran.—It is stated that 2 Colorado men have closed a deal for this mine and mill, 4 miles west of Rochford, in Hornblende Camp. The ore is run through a Huntington mill. The company proposes to erect a large stamp mill on Castle Creek, 2 miles south.

UTAH.

(From Our Special Correspondent.)

Ore Supply.—Manager T. R. Jones, of the smelter trust for Utah, states that the ore supply in this territory is over 50% greater than on the opening of December, 1898. The copper produced by custom smelters will be 50% more than last year. At the Germania and Mingo plants there are 7 large stacks in blast on lead smelting and a new stack is being put in at the Mingo. All the small stacks are out of commission for lead smelting, though 2 are used for copper.

Bullion and Ore Shipments.—During the week ending December 9th the different smelteries sent forward 27 cars, or 1,143,021 lbs. lead-silver bullion; 4 cars, or 184,261 lbs. copper bullion. In the same week there were shipped to smelteries outside the State 34 cars, or 1,408,935 lbs. of ore and concentrate products.

Beaver County.

(From Our Special Correspondent.)

Horn Silver.—On December 6th, at Salt Lake City, the directors elected the old officers for another year, and the following day President Washington and the Utah directors took the train for the mine. Shipments are being maintained between 1,100 and 1,200 tons per month, about ½ concentrates and the other ½ evenly divided between copper and lead-silver ore. Lower workings favor improvements in copper. Asked as to a Christmas dividend, President Washington said that would not be decided till his return to New York.

Washington-Frisco.—Officers chosen for the current year are: Allan C. Washington, president; James Sharp, vice-president; M. C. Morris, secretary-treasurer, and P. T. Farnsworth manager. Incline shaft is down 180 ft. and bottom shows some good copper rock.

Juab County.

(From Our Special Correspondent.)

Tintic Shipments.—In the week ending December 9th there were sent out from the 3 rail points of the district 2 bars of bullion 64 cars of ore and 7 cars of concentrates, to be credited as follows: Centennial-Eureka, 15 cars of ore;

Mammoth, 2 bars of bullion, 10 cars of ore, 3 cars of concentrates; Grand Central, 10 cars of ore; Swansea, 6 cars; Humbug and Uncle Sam, 5 cars; Bullion Beck, 4 cars concentrates; Godiva, 4 cars ore; Showers Consolidated, 1 car ore and Tintic Iron 13 cars of hematite for flux.

Centennial-Eureka.—On December 5th the Bostonians paid $560,000 for the last 8,000 shares held in escrow in McCornick's Bank, rounding out the $2,100,000 paid for the property, and the same day the old board met for the last time. The Utah company is no more and in its stead the Centennial-Eureka Mining Company of Maine is at the helm. General Superintendent C. E. Allen says that after the present month the production of 50 tons daily will be doubled. In the treasury of the old company is about $15,000, which will be the final dividend paid to the old shareowners.

Eagle-Blue Bell.—Surface betterments are about finished. Exploration gives encouraging showings. Some good lead ore is mined in addition to the dry gold-silver products.

Four Aces.—On December 6th the threatened suit was brought against South Swansea, claiming $455,000 damages. The Four Aces alleges that its vein dips into South Swansea ground and, having the apex, has the right to follow the ore. South Swansea is the senior lode, with a well-marked outcrop, but the 2 veins come together at about 700 ft. depth. Trial is set for January 19th. In that vicinity are 6 shaft houses within almost a stone's throw and other suits may follow. Meanwhile, South Swansea is enjoined from mining ore. As the Four Aces is a cross vein, the prevailing opinion is that it will have trouble to prove its contention.

Grand Central.—It was reported on December 9th that the ledge is cut on 900-level with a good ore showing. The report is not confirmed.

May Day.—Within 30 days the cutting of the station in tunnel and installing the engine will be finished and start made on the new shaft. A 200-ton ore house, shaft house and blacksmith shop are recent improvements. Superintendent Hunt expects to resume shipments by January 15th.

Salt Lake County.

(From Our Special Correspondent.)

Bingham Copper and Gold.—Main cross-cut tunnel is showing softer rock, which is supposed to be close to the ledge.

Boston Consolidated.—Nothing new has occurred. Exploration goes on. It can be said that the management seems more sanguine than ever.

Columbia.—The lost vein is found and Manager R. B. Cook anticipates a good ore body. Concentrating the low grade did not afford a good saving, owing to the copper carbonates and oxide which went off in the tails.

Puritan.—W. H. Tibbals has resigned the presidency, and W. H. Child is chosen in his stead.

Silver Shield.—A 4-carload shipment of good grade crude is being made and some 40 tons of concentrates are at the Rogers mill. The Shield is opening ore in new ground.

Utah Consolidated.—Preparations for winter are completed. No. 7 workings are bringing to light some of the best copper rock found, and No. 6 and No. 5 continue to show finely. The smelter will hardly be able to handle 200 tons of ore per diem until the promised enlargement is a reality.

Summit County.

(From Our Special Correspondent.)

Park City Shipments.—In the week of December 9th the total smelter products marketed through the Mackintosh sampler was 2,443,220 lbs. made up as follows: Silver King, crude, 1,063,630; concentrates, 371,200 lbs.; Daly-West, concentrates, 356,720 lbs.; Apex, crude and concentrates, 224,240 lbs.; Anchor, concentrates, 215,950 lbs.; Loring Bros., concentrates, 112,850 lbs.; Cooney, concentrates, 46,560 lbs.; Bird, concentrates, 14,130 lbs.

Ore Production in 1899.—It is the custom of the Mackintosh sampler to close its year on December 1st, and its books show that during the past 12 months shipments were made as follows: Silver King, 58,599,545 lbs.; Ontario, 23,162,789 lbs.; Daly-West, 22,868,030 lbs.; Anchor, 11,885,845 lbs.; Apex, 997,900 lbs.; Valeo, 729,595 lbs.; Loring Bros., 527,600 lbs.; Feeney, 339,350 lbs.; Cooney, 218,120 lbs.; Wykoff, 150,860 lbs.; Wright, 105,510 lbs.; sundry small lots aggregating 780,036 lbs. The total for the year is 120,363,175 lbs., compared with 76,562,945 lbs. for the prior 12 months. This handsome increase is due to the return of Daly-West to the shipping roster and Ontario's enlarged output.

Daly-West.—The little friction with the smelters is settled by a compromise. It appears the 3 test lots of ore that were resampled at Taylor & Brunton and Conklin samplers gave different results with each sampling, including the original sampling at the Mackintosh plant. While not very wide apart, the differences make a considerable sum to a generous producer like the Daly West. It is "mutually" agreed that hereafter 1/3 of the ore will go to each sampler, so that the Mackintosh home plant will not handle all the ore from this region.

Marsac Mill.—Up to December 10th the weather continues propitious for handling the tails from Ontario mill. About 100 tons a day are treated.

Ontario.—On November 1st there was $302,000 in the treasury which has not been added to the past month, owing to the "friendly" disagreement with the smelters as to ore sampling. The court of first and final appeal will render its decision soon. There is marked improvement underground. Fully 2/3 of the ore mined comes from 600 to 1,500 ft. levels and the other 1/3 is its last ore from the upper workings. At present 155 men are employed and this force will continue through the winter.

Tooele County.

(From Our Special Correspondent.)

Daisy.—The proposed $10,000 is subscribed by some of the large holders to take care of pressing debts. The debts all told amount to $35,000. It is anticipated that the mill, treating 240 tons a day, will show a profit of $5,000 per month at least. Prior forecasts have failed of fulfilment, and there is not much encouragement that this will prove an exception.

De La Mar.—Work is being actively pushed on the steam power plant construction. The 4 new leaching tanks, capacity 1,040 tons, will go in commission next week. The successor to Metallurgist D. C. Jackling is not yet named.

Mercur.—It is learned in the first 9 months of 1899 that $342,000 gross was produced, $42,000 in October and about $50,000 in November, and the management intimates this showing should satisfy shareowners. It is said the mines are being crowded to make a temporary record—the annual meeting is in January—and the story of last winter may be repeated. The mill is not making a clean extraction, and conditions today resemble those of a year ago.

WASHINGTON.

Okanogan County.

(From Our Special Correspondent.)

Okanogan Free Gold.—Two gold bricks weighing 238 oz. are the result of the second cleanup at the mill.

Palmer Mountain Gold Mining and Tunnel Company.—The drifting force has been increased, much good ore is being mined, the main tunnel is in 2,530 ft., and the breast is 1,225 ft. deep vertically. Machinery for the water power is under consideration, but will not brought in till snow comes.

Pakell.—This group has been bonded for $50,000 by J. J. Hughes of Fargo, N. D., in the interests of Milwaukee parties.

Wehe Consolidated Mining and Milling Company.—This company has recently got 26 claims belonging to 3 corporations, the Wehe, Pasco and Bucky companies. A vertical 2-compartment 500-ft. shaft, a 525-ft. tunnel, 100,000 ft. mine timbers, a pump, are all contracted for, the pump to be put in at once, and shaft and tunnel to be completed July 1, 1900.

Pierce County.

Carbon Hill.—An explosion of gas or dust in these coal mines near Carbonado, owned by the Southern Pacific Railway Company, instantly killed 32 men on December 9th. Eight other men were badly burned or injured. The exact cause of the accident will probably never be known, as all the men near the explosion were killed. Inspector Rees Jones had reported the mine clear of gas on the morning of the accident.

WEST VIRGINIA.

Davis Coal and Coke Company.—The capital stock of the West Virginia & Pittsburg Railway Company has been increased to $10,000,000, and the increased stock was applied to purchasing all the lands and properties, real and personal, of the Davis Coal and Coke Company. This brings under the ownership, control, and management of the West Virginia Central nearly 100,000 acres of coal and timber lands, lying east of the Alleghenies, covering, it is stated, the largest body of bituminous coal nearest to tidewater.

Arrangements have been made to increase the capacity of the coal mines and coke ovens. The officers of the new company will be: Former Senator Henry G. Davis, president; Senator Stephen B. Elkins, vice-president; F. S. Landstreet, general manager of the mining and sales department; C. L. Bretz, general manager of the railroad; Howard Sutherland, general land agent. Former Senator Davis controlled the Davis Coal and Coke Company and Senator Elkins the railroad company.

WYOMING.

Carbon County.

Kurtz-Chatterton.—Chas. E. Knapp, a California man, has bonded this property at Grand Encampment for $50,000, and has organized the Kurtz-Chatterton Copper Mining Company with a capital of 1,000,000 shares of $1 each. The company is to put in a concentrating plant with hydraulic sizers. The concentrates will be smelted at the Boston-Wyoming smelter at Grand Encampment. The trustees for the first year are Charles E. Knapp, George R. Adams, O. W. Hinkley, A. H. Heber and C. C. Swinton.

Eureka Copper Mining Company.—Boston, Chicago and Denver men have secured a controlling interest in this company, which owns a group of claims 3 miles from Grand Encampment, between the North and South Forks of Grand Encampment River.

Uinta County.

Diamondville Coal and Coke Company.—The company resumed work at its collieries at Diamondville on December 8th. A large force of deputy sheriffs was on hand to protect property and keep the 200 miners who returned to work from being molested. The company refused to accede to the demands of the union agitators, saying it reserved the right to employ whomsoever it chose as well as discharge whomsoever it found inefficient without being dictated to by anyone or combination of individuals, and that the agitators must go and never again receive employment from the Anaconda Company.

FOREIGN MINING NEWS.

AUSTRALASIA.

New South Wales.

Broken Hill Proprietary Company.—This company's statement for the four weeks ending November 8th shows a production from the refinery of 2,562 tons lead, 29 tons hard (antimonial) lead, 421,323 oz. silver and 1,521 oz. gold.

Queensland.

Mount Morgan Gold Mining Company.—This company reports for the month of October 21,034 tons of ore chlorinated. The gold recovered was 17,413 oz., showing an average of 0.83 oz. to the ton.

The gold production in October is reported by the Mines Department as 82,936 oz., of which 81,708 came from quartz mining operations and only 1,228 oz. from alluvial or placer work. In October, 1898, the total was 77,915 oz., showing an increase of 5,021 oz., or 6% this year.

Tasmania.

Mount Lyell Mining Company.—This company reports for the four weeks ending November 15th a total of 21,743 tons ore smelted. The product was 759 long tons copper bullion, containing 750 tons fine copper, 62,994 oz. silver and 2,370 oz. gold. The average return was therefore 3.45% copper, 2.90 oz. silver and 0.11 oz. gold to the ton.

Victoria.

The gold output for September is reported by the Mines Department at 68,915 oz., or 1,690 oz. less than in September, 1898. For the nine months ending September 30th, the total output was 616,578 oz.; this compares with 593,843 oz. last year, showing an increase of 22,773 oz., or 3.8% this year.

CANADA.

British Columbia—East Kootenay District.

(From Our Special Correspondent.)

Gooderham Blackstock Syndicate.—This corporation has consolidated its interests with those of the Canadian Gold-fields in East Kootenay properties.

North Star.—The new tram is almost completed and the railway between the mine and St. Mary's River will be ready before December 31st.

St. Eugene.—The concentrator is nearly ready.

British Columbia—West Kootenay District.

(From Our Special Correspondent.)

Rossland Ore Shipments.—The output of ore for the 11 months and 7 days ending December 7th amounted to 167,500 tons gross.

Bonanza.—This company has purchased from the Jenckes Machine Company a complete prospecting plant, with a 50 H.P. engine and boiler.

British-American Corporation.—The management has ordered a 1 H.P. engine and boiler for the Nickel Plate from the Jenckes Machine Company.

Giant.—The management has ordered a 10-drill compound compressor from the Jenckes Machine Company. The plant will be run by a 160 H. P. General Electric motor.

British Columbia—Yale District.

(From Our Special Correspondent.)

Racket.—This group of 4 claims has been bonded to H. L. Percy, one of the principal stockholders in the Hillside Company, whose ground it adjoins. A quartz ledge, from 60 to 125 ft. wide, is traceable for over 1¼ miles. A tunnel 600 ft. north of the Racket claim is into the ledge, but no assays have been reported. The 2 groups can be worked through the Hillside tunnel.

Gold Drop.—This claim is next the Snowshoe in Phoenix Camp. It has a tunnel 40 ft. in, with crosscuts of 96 and 200 ft. A shaft is being sunk. The vein is 7 ft. wide. S. A. Easton is manager. Additional machinery has been ordered.

Mountain View.—This old claim in Summit Camp has been bonded by John Dorsey for $25,000. A tunnel 30 ft. in and a few open cuts comprise the development. Assays give $11.30 in gold and copper.

Seattle.—This group is some 7 miles from Columbia on the North Fork of the Kettle River, and about 9 miles from the international boundary on the main line of the Canadian Pacific. On the Seattle three shifts are driving a tunnel to cut the vein, which is 30 ft. wide at surface, at a depth of about 100 ft. Property has been in litigation for years, and the ownership is uncertain, but it probably has merit.

Ontario—Matawin District.

(From Our Special Correspondent.)

Atikokan Iron Range.—Thos. Wiegand, for a Duluth, Minn., iron interest, has driven 110 ft. into the outcrop. Assays average 63% iron and from .02 to .03% phosphorus. There are no other impurities of moment, it is stated. The ore is a magnetite.

Black Bay Explorations.—New York interests are taking hold of a galena and zinc property near Black Bay, north shore of Lake Superior, and expect to explore extensively under option. There is a considerable showing of both lead and blende.

Zenith.—This zinc mine at Rossport, east of Fort William, has closed owing to a disagreement between the owners over royalty due one of them. He demands $100,000 in cash to sell out. Preparations had been made for extensive work this winter. The mine is 14 miles to the Canadian Pacific Railroad. The property is very valuable.

Yukon District.

According to United States Consul McCook, at Dawson, navigation on the Yukon closed about the middle of October. The annual census shows the adult population of Dawson to be 3,660 males and 786 females, with 163 children under 14 years. Over 3,200 of the inhabitants are from the United States. About 2,000 people are estimated to have left for the Cape Nome fields in August and September. Cordwood at Dawson is worth $20 per cord. An inferior lignite is also sold as fuel, bringing $30 per short ton at the yard.

MEXICO.

Durango.

The Supreme Court of Durango recently rendered a decision restoring the Vacas, San Marcos and Bismarck mines, located in Durango, to their original American owners.

The mines were acquired by Americans several years ago, the stockholders being New York and New England capitalists. W. J. Grace was elected secretary and placed in charge.

The new owners made improvements and had begun the developments of the mines on an extensive scale when a detachment of rurales took possession of the mines, forcibly ejecting Mr. Grace. A rival company, which was installed, is now ejected by the Court.

Sonora.

The Southern Pacific Railroad, it is said, has purchased coal lands 70 miles south of Ortez in this State, as the result of exploration work it has been carrying on. It is also said that the company will run a branch road to the field and ship to Guaymas.

COAL TRADE REVIEW.

New York. Dec. 15.

Anthracite.

With winter at hand, the anthracite trade from now on will be greatly influenced by the temperature. Warm days will check retail buying, which will start in again with a rush on the coming of a cold wave. Generally speaking, producers and dealers of anthracite coal are going to have a merry Christmas.

The November output, it seems, was 4,685,992 tons. It is doubtful, taking the holidays into account, if the December output will be much larger. Production is limited by car supply. Many cars have been released from Western trade by the stopping of lake shipments, but it takes a little time for these cars to get back to the collieries. The Pennsylvania road may be expected to increase its output considerably, however, now that the long-drawn strike at Nanticoke is off.

The continued mild weather in the West has not called out retail buying, and unless the winter proves very severe there is coal enough at the head of the lakes to last till spring. In Chicago territory, also, the outlook is more favorable, though a lot of coal will go to that territory by rail. At Eastern points retail buying fluctuates, but the trade is generally in first-class shape.

The demand for the steam sizes is active, with prices firm for good coal. Of the prepared sizes, chestnut continues in most demand. We quote for free burning anthracite f. o. b. New York: Stove, $4.15@$4.25; chestnut, $4.25; egg, $3.90; broken, $3.50; with pea selling at $2.75, buckwheat $2.15 and rice $1.45.

Bituminous.

The heavy demand for coal in the Atlantic seaboard bituminous trade continues, but there are indications that the situation will soon be easier. Some of the poorer grades of coal are being offered at what may be called prices—high prices, to be sure—but the coal is actually offered and possible buyers are not stood off. Some people in the trade are getting a fair understanding of the general situation and can see light in the distance.

The merging of interests by the Davis Coal and Coke Company and the West Virginia Railroad is described by disinterested parties as simply a public acknowledgment of relations between the concerns which have long been understood by other producers.

The demand for coal is easier at points beyond Cape Cod than anywhere else. All the shoal-water port orders are not filled yet, but there are boats at the shipping ports to take coal that will about finish up business. If the weather continues fair, however, it is quite possible that many buyers will try to get just one more vessel load before navigation is closed. The fair weather has been a wonderful help to producers with delivered contracts unfilled. It has saved them many thousands of dollars. Sound ports are still clamoring for coal and cannot seem to get enough. New York harbor demand is still very heavy. All rail trade continues very active, and the year's tonnage will be considerably in excess of last year's.

Gossip over next year's prices is heard more frequently. Nothing definite will be known till the railroads are heard from, but present rumors indicate that an advance of nearly $1 per ton at the mines may be openly advocated before long. What consumers may have to pay is something for them to think about.

Car supply is unchanged; no improvement yet. Transportation on most roads is fair; on the Pennsylvania it has been delayed. In the coastwise vessel market vessels are in better supply, or, at least, can be secured on better terms where anything like prompt loading is offered. Freight rates are correspondingly weaker. We quote rates from Philadelphia as follows: Boston, $1.80@$1.85; Providence, New Bedford and the Sound, $1.40@$1.50.

Birmingham, Ala. Dec. 11.

(From Our Special Correspondent.)

The demand for coal in Alabama is so great that all the mines, though in full operation, cannot begin to fill it. There are four or five mines in the course of opening, and by the early part of January will be reporting good outputs. The Bruce Coal Company is opening a mine between Parrish and Cordova, on the Southern Railway, and the Pratt seam is being worked. By January 1st the output will be 100 tons a day. The Republic Iron and Steel Company is preparing to open the largest mine in the State near Sayreton, North Birmingham. T. T. Hillman and H. E. McCormack are opening a mine near Blossburg, in Jefferson County, and will shortly have a side track running to their place. Their output by January will be 200 tons per day. The Tennessee Coal, Iron and Railroad Company is now operating two new mines near Ensley. The increased production will be needed about the steel plant and other industries at Ensley. The Sloss Iron and Steel Company has the mines at New Found, this county, in operation, and 31 of the 100 coke ovens in full blast.

The great scarcity of coal in New Orleans and in Atlanta has been reported officially to the operators and railroad officials in this district. The barge line down the Mississippi River which carries Walker County, Ala., coal from Greenville, Miss., down the river, will not carry any coal into New Orleans. It will, however, furnish coal to the various sugar plantations along the river and this trade is being well supplied. Another tow of coal, 12 barges, each carrying from 500 to 750 tons of coal, is being loaded now to be sent down the river. The railroads are carrying from 25 to 40 cars of coal to New Orleans daily, the Southern Railway handling over 20 cars a day via West Point, Miss., where the Illinois Central Railroad gets it and carries it to the Crescent City. The scarcity of coal in New Orleans and along the Mississippi River is accounted for in the fact that the river from Pennsylvania is so low that tows of coal cannot be carried down as conveniently and safely as desired. It is believed that by the time the river gets in shape for barges to go down easily the cold weather will interfere. The Alabama operators therefore are being called on for all the coal they can furnish and conditions were never so active as they are now.

Chicago. Dec. 12.

(From Our Special Correspondent.)

Anthracite Coal.—The demand for anthracite coal continues fairly good, though the colder weather left quickly and sales did not come up to expectations. Out-of-town buying has been fairly good, requests to hasten coal being a little more frequent; indications are that supplies throughout the adjacent territory are rather small, and very cold weather would creat a large movement of hard coal. There is no enlarged supply of chestnut coal, and from present appearances the demand for this line will far exceed the supply for some months to come. Prices hold well to circular; they are $5.75 for egg and stove and $6 for chestnut.

Bituminous coal has strengthened somewhat, owing to the colder weather and the renewed buying by concerns which are anticipating colder weather. Manufacturers and railroads, as well as the large office buildings, are in the market for large quantities of soft coal, and in consequence prices have stiffened. There continues yet a shortage of soft coal, but some advance is being made from week to week, the railroads offering more cars in which to convey coal. The better grades of soft coal, those used largely in domestic lines, are in fair supply at prices that are good and look like advancing.

Coke sales are limited only because of supply. Agents here cannot meet the demand for coke and there is every appearance of a shortage for some time to come. Premium prices are paid for good article of coke.

Pittsburg. Dec. 13.

(From Our Special Correspondent.)

Coal.—The long-expected rise in the rivers came last night, and to-day and to-night over 50 tow boats left for Southern ports, taking about 13,000,000 bushels, or a little over one-half of the coal loaded. It is believed by river men that the high water will hold out long enough to enable the tow boats to return and take the balance of the tows ready to go out. Coal has been scarce at Cincinnati and Louisville, and the market has been supplied by rail. Prices at Cincinnati and Louisville have been 8 and 9c. a bushel, but with the present shipment the price to be asked is 6 and 7c. All the large boats, which each hold 25,000 bushels, got out to-day. They are for the New Orleans trade, but will be detained at Louisville until there is sufficient water to carry them South. It requires 20 ft. of water at Cairo for a heavy tow of coal boats and there is but 6 ft. to-day. The rise in the three rivers is expected to bring the Mississippi up to this stage within 10 days. The boats started to go out at 6 o'clock this morning. In the rush the "Pacific" collided with the tow of the "Charlie Clark" and sank. Its tow of coal was promptly cut loose and saved. The present shipment of coal is the first since May 20th.

The Pittsburg Coal Company has advanced the price of slack 20c. a ton, making the present price 75c., the highest price at which slack has been sold in this district in the history of the coal trade. Before the consolidation slack could be bought at 15@20c. a ton.

Connellsville Coke.—The production and shipment of coke last week declined somewhat. The car supply, it is expected, will soon begin to improve, when the ovens will be operated to their fullest capacity. The production last week was 194,853 tons, and the shipments aggregated 10,191 cars, distributed as follows: To Pittsburg and river tipples, 3,362 cars; to points west of Pittsburg, 5,771 cars; to points east of Connellsville, 1,658 cars. This is a decrease of 942 cars compared with the previous week.

SLATE TRADE REVIEW.

New York. Dec. 15.

The shipments of slate from Slatington and Walnutport, Pa., for the 11 months of this year are compiled by us as follows:

	Roofing squares.	School cases.	Blackboard crates.
January	13,006	236	1,289
February	7,979	1,046	938
March	10,644	1,527	1,057
April	19,640	1,043	921
May	29,700	885	1,283
June	20,247	2,264	1,323
July	22,255	2,714	3,403
August	15,878	1,573	3,448
September	21,088	2,474	3,939
October	23,036	1,851	3,411
November	14,965	1,424	1,704
Total	198,438	17,037	22,736

In the November shipments there was a decrease of 8,071 squares roofing slate, 427 cases school slates, and 1,707 crates blackboards. Of the total movement in the 11 months Slatington reported 192,962 squares of roofing slate, or 97%; 16,712 cases school slates, and 22,057 crates blackboards. Walnutport shows shipments of 5,476 squares roofing slate, 325 cases school slates, and 679 crates blackboards.

Soon the quarries will all be shut down and work discontinued until after the usual rubbish clean-up early next year. The banks have been well cleared up, and not enough stock will be on hand in January to affect the market. Notwithstanding this, however, some restoration in prices will be necessary to meet the expectations of quarrymen and dealers, especially in roofing slate. During the last few weeks practically

no attention was given to the schedule, each seller shading prices more or less. In fact, there are evidences that the old-time cut-throat policy may be revived. Surely a more satisfactory business could be done if operators will only exercise more judgment. It is well, therefore, that our quarrymen formulate new business methods while they are contemplating another price list for the new year.

On the other hand, the increased cost of production, and possibly higher wages in 1900, will no doubt induce sellers of roofing and other merchantable slate to deviate less from the new schedule of prices.

Exports are not large, owing to the continued high freight rates.

The list of prices per square for No. 1 slate, standard brand f. o. b. at quarries in carload lots, is given below:

Prices of Roofing Slate.

Size, inches	Monson or Br'n ville.	Bangor.	Bangor Ribbon.	Alb'n, or Jackson Bangor.	Lehigh.	Peach Bottom.	Sea Gr'n.	Unfad'g Green.	Red.
	$	$	$	$	$	$	$	$	$
24 x 14	6.10	3.50	3.00	3.35	3.25	5.10	3.00	.....	.....
24 x 12	6.60	3.50	3.00	3.35	3.25	5.25	3.00	3.75	.....
22 x 12	6.60	3.50	3.25	3.50	...	5.25	3.00	3.75	.....
22 x 11	6.50	3.75	3.25	3.50	3.35	5.25	3.00	4.00	.....
20 x 12	6 90	3.75	.....	3 50	3.35	5.25	3.00	3.75	.....
20 x 11	6.80	.....	.....	4.00	3.35	5.25	3.00	.....	.....
20 x 10	6.80	4.50	3.50	4.00	3.60	5.35	3.25	4.25	9@10
18 x 12	6.80	3.75	.....	3.50	....	5.25	3.00	3.50	.....
18 x 11	7.00	....	.....	.....	...	...	3.00	3.75	.....
18 x 10	7.20	4.50	3.50	4.00	3.60	5.35	3.25	4.00	9@10
18 x 9	7.10	4.50	3.50	4.00	3.60	5.35	3 00	4 25	9@10
16 x 12	6.80	3.75	....	3.50	....	.....	2.85	3.50	.....
16 x 10	7.10	4.25	3.50	4.00	3.60	5 25	2.85	4.00	9@10
16 x 9	7.00	4.25	.....	4.00	3.60	5.35	2.85	4.25	9@10
16 x 8	7.20	4.50	3.50	4.00	3.60	5.35	2.85	4 25	9@10
14 x 10	6 60	3.75	3.25	3.35	....	5 25	2.75	3.75	9@10
14 x 9	6.50	....	.....	.....	....	.....	2.75	3 75	9@10
14 x 8	6 60	3.75	3.25	3.35	3.25	5.10	2.75	4.25	9@10
14 x 7	6.40	3.75	3.25	3 35	3.25	5.10	2.50	4.25	9@10
12 x 10	5.80	.....	.....	.....	.....	...	2.50	3.25	.....
12 x 9	5.60	.....	.....	.....	.....	.....	2.50	3.25	.....
12 x 8	5.50	3.50	.....	3.35	3.25	4 85	2.50	3.50	8¼@8¾
12 x 7	5.00	3.25	.....	3.35	3.25	4.85	2.50	3.50	8¼@8¾
12 x 6	4.80	3 25	....	3 35	...	4.75	.....	3 50	8¼@8¼

A square of slate is 100 sq ft. as laid on the roof.

In Brownville and Monson delivery quotations can be had somewhat lower than above, which is also true of other brands. No. 1 Bangor are 50c. extra when full 3/16 in. Intermediate sea green, $2.25@$2.45 per square, according to size.

IRON MARKET REVIEW.

NEW YORK, Dec. 15, 1899.

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending Dec. 16, 1898.		Week ending Dec. 15, 1899.		From Jan., '98.	From Jan., '99.
	F'ces.	Tons.	F'ces.	Tons.	Tons	Tons.
An' racite	29	22,050	47	42,175	1,095,678	1,675 580
Coke.....	148	208,850	210	249,575	9,811,723	11,043,866
Charcoal.	18	6,350	30	7,650	297,109	290,157
Totals..	195	237,250	287	293,400	11,204,510	13,009,603

The market continues quiet so far as new business is concerned, and there is but little of special consequence to note. Some sales of Bessemer and foundry irons have been made in Pittsburg, but not of very large amount. On the other hand, there has been some activity in steel billets, and several contracts of importance have been concluded.

In finished material there has been again some demand evident for structural material. The difficulty about placing contracts is on the question of time of delivery. Buyers are apt to name dates which the mills cannot guarantee to meet. There has been more activity in the rail market, and contracts for some 50,000 tons have been placed with more under negotiation.

The demand for iron ores is shown by the fact that contracts have been closed by furnaces in Eastern Pennsylvania for some 200,000 tons of Newfoundland ore. The price to be paid is 7½c. per unit of iron f. o. b. cars in Philadelphia.

Some large shipments of steel wire and wire nails are being made to Australia, and also to China and Japan. Some trade in wire and nails to South American countries is also reported.

Birmingham, Ala. Dec. 11.

(From Our Special Correspondent.)

The holiday quietness in the pig iron market has set in and there is not such a great demand. However, the heavy shipments continue, though the business is on orders taken in some months since. The railroads are being urged to move great quantities of iron, and it seems that the furnacemen are desirous of getting away from here just as much of the product as possible, and they are succeeding quite well. There were some fears expressed that prices were not going to hold out, but as far as can be learned rumors to the effect that some iron had sold in this district at less than quoted prices could not be verified. It is a certainty, however, that No. 1 foundry will not go to $20 per ton this year, though it was predicted a few months ago that it would. Notwithstanding the numerous furnaces repaired and made ready, the production has been increased very little during the year. The Tutweiler Coal and Iron Company's furnace at Vanderbilt, near here, a less than 100-ton furnace, was about the only furnace to go into blast. All the other furnaces were either in blast or had been in blast within the last year or two. There are several now ready for blast and may go to work before the end of the year. The delays in the repairing of furnaces in Alabama have been numerous.

The steel plant is preparing to blow in more furnaces. It will be several weeks yet before the plant will be in full operation. The Tennessee Coal, Iron and Railroad Company will build a steel foundry at Ensley and will make steel castings there. It is given out that a plant costing $150,000 will be put up and that employment will be given to 150 men. The steel wire and rod mill adjacent to the steel mill is now nearing completion, and it will not be long before it will be in full blast.

The Republic Iron and Steel Company, which has a two-furnace steel plant in connection with the rolling mills in this city, has started work on a blooming mill and will also double the capacity of the little steel plant.

In finished iron there is a good demand, the rolling mills are producing heavily and shipments are enormous. Prices are steady in finished products and no indications of an abatement. The mills will not be shut down long for the holidays.

The following quotations are given for pig iron: No. 1 foundry, $18.50@$19; No. 2 foundry, $17.75@$18.50; No. 3 founry, $16.50@$17.50; No. 4 foundry, $16@$16.50; gray forge, $16@$16.25; No. 1 soft, $18.50@$19; No. 2 soft, $17.75@$18.50.

Another big iron and steel company is forming for Alabama. The properties of the old Alabama Iron and Steel Company, located at Brierfield, in Bibb County, have passed, through a judgment by default in the United States courts, to the reorganization committee and a company is now forming in New York to take hold of the properties, put them in condition and operate them on a big scale. The properties consist of furnaces, rolling mill, nail mill, town lots, coal and ore properties, besides engines, cars and a short railway line around the works. The property is worth over $500,000.

Buffalo. Dec. 13.

(Special Report of Rogers, Brown & Co.)

The strength of this market, considering the season of the year, is a surprise to producers as well as consumers. Furnaces had hoped there would be a let-up in demand for shipments, but instead there is a constant request for iron faster than contracts specify. No one seems willing to have furnaces hold up, and those producers who figured on accumulating a working stock during December and early January are likely to be disappointed. Several medium-sized contracts, in addition to numerous small ones, entered during the week, made up a goodly tonnage. We quote below on the cash basis f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, $24@$24.50; No. 2 strong foundry coke iron, Lake Superior ore, $23.50@$24; Ohio Strong softener No. 1, $24.25@$24.75; Ohio strong softener No. 2, $23.25@$23.75; Jackson County silvery No. 1, $31; Southern soft No. 1, $23.50; Southern soft No. 2; $22.50; Lake Superior Charcoal, $26@$27; coke malleable, $24@$24.50.

Chicago. Dec. 12.

(From Our Special Correspondent.)

Pig Iron.—Numerous calls for small lots of pig iron are the rule, mostly for immediate delivery, some larger orders being placed for iron to be delivered after June, 1900. The talked of advance in freight rates of 15c. per ton after January 1st has doubtless stimulated the buying of Southern irons, the week's business having been good, though most sales made have been subject to the advance. The market continues to have great strength, and from present prospects prices are likely to remain fully as high as at present for some time to come. The Iroquois furnace, at South Chicago, is again producing iron, but its product has been sold months ahead. Prices are as follows: Lake Superior charcoal, $25.50@$26; local coke foundry No. 1, $24.50@$25; No. 2, $23.50@$24; No. 3, $22.50@$23; local Scotch No. 1, $25@$25.50; Southern Coke No. 1, $23@$24; No. 2, $22@$23; No. 3, $21@$22; Southern No. 1 soft, $23@$24; No. 2 soft, $22@$23; Ohio strong softeners, $25@$26; malleable Bessemer, $25@$26.

Cleveland, O. Dec. 13.

(From Our Special Correspondent.)

Iron Ore.—The anxiety shown here by iron men to get more ore on the docks of Cleveland than they have thus far been able to obtain may be inferred from the fact that vessels have been chartered within the last few days to bring additional cargoes from Escanaba. The chartered vessels are now being loaded with coal at the Cleveland docks and the intention is to load them with ore for their return. The rate to be paid is $1.25 per ton from Escanaba, and the cargoes will probably be the latest ever brought to Cleveland for a given season.

It is now estimated that the volume of ore shipped into the Lake Erie ports during the year 1900 will reach above 18,000,000 tons, which will be about 2,000,000 tons more than was received here during any previous year. It is generally understood that an agreement has been reached among ore men as to the selling price of all grades of ore for next season. Quite a large number of sales have been made during the past week for delivery next year. A few sales have also been made for immediate delivery, at which the figures are as follows: Specular and magnetic ores, Bessemer quality, $6@$6.25; specular and magnetic ores, non-Bessemer, $5@$5.15; hematite ores, Bessemer quality, $5@$5.25; red hematite ores, non-Bessemer quality, $4@$4.50.

Pig Iron.—Quite a number of transactions during the past week are reported. A fair proportion of these sales have been Bessemer metal. The market for every kind and grade of iron is very firm, and a further advance is quoted for Bessemer. All tendencies are toward still higher prices. The following are present quotations for iron f. o. b. Cleveland: Lake Superior charcoal, $26; Bessemer, $24.50; No. 1 foundry, $23.50; No. 2, $23; No. 1 Ohio Scotch, $22.50; No. 2, $22; gray forge, $21.

Philadelphia, Dec. 14.

(From Our Special Correspondent.)

Pig Iron.—The approach of the holidays has not been characterized by any additional interest in crude iron. There are buyers, of course, who are always ready to pick up iron, provided it is of the brand they desire and at a fair price. There is not the same rush nor the same anxiety to pick iron regardless of quality or price as there was even as late as a month ago. Still, consumers are very anxious to secure iron, and particularly in view of the fact that a great deal of new work is coming in. Foundrymen are anxious to keep a certain amount of stock on hand, or rather a certain amount of material under contract for future delivery. Forge iron users are less anxious, having contracts further ahead. There is nothing now being done in Bessemer, low phosphorus or basic iron, although agents for those irons say that large buyers are ready to make heavy purchases just as soon as the conditions warrant. Quotations remain just where they were a week ago. As far as can be seen it is not probable that very much business will be done in pig iron in this market until after the holidays.

Muck Bars.—Two or three inquiries are in the market for muck bars, and one sale only has been reported since Monday, although doubtless more has been sold.

Merchant Iron.—All the mills continue to work full time, and everything is moving along satisfactorily at old prices. The only new business that can be traced up has been done in test and special steel bars, for which it is said there would be a very good demand, provided better deliveries could be made—that is, earlier deliveries.

Skelp Iron.—According to engineers interested in trolley road construction, there will be an extraordinary demand for skelp iron. No business is being done at the present time, but it is understood, or at least it is said, that some big contracts will be placed in January for spring delivery.

Sheet Iron.—The sheet iron market is quiet, and because the manufacturers refuse to make desired concessions it is dull. There is no disposition to push for orders, because manufacturers know that by current consumption the necessities of buyers will enable them to keep the figures pretty nearly to 3.80c. for No. 28.

Merchant Steel.—While there is no new business in merchant steel, there is an enormous consumption, and the mill agents here feel perfectly satisfied the way things are going. As to the talk about lower prices, there is nothing in sight to enable any one to draw an opinion one way or another. It is known, though, that productive capacity around Pittsburg has been very heavily increased.

Plate Iron.—Mill owners are endeavoring to get themselves in shape by the opening of the year to accommodate a few of the very urgent customers for boiler plate, the demand for which seems to have no end. There is inquiry for all kinds of plates, but manufacturers have endeavored to load up with as little new work as possible. Quotations are omitted, as it is impossible to make any authorized changes.

Structural Material.—During the past two days several inquiries have been received for shapes for office buildings, and engineers who are familiar with this line of work say that there is a good deal of such business being taken care of before the opening of spring. Contractors in some cases have neglected to place their orders in time and have run their chances on being able to crowd in orders at the last moment. Some of them will do it, but at a high price.

Old Rails.—Old rail quotations are unchanged; $27 is offered to-day, with $29 asked.

Pittsburg. Dec. 13.

(From Our Special Correspondent.)

The iron and steel trade is quiet and very much like the usual dull periods of the last month of former years. No material change in prices has occurred, and scarcely any new business for this year was received. With but few exceptions the mills are not running as full as usual. The only transactions of any consequence during the week were sales of Bessemer pig iron aggregating 25,000 tons for delivery up to July 1st, 1900, at $24 in the Valleys. No sales for this month have been made since last week, and there is but little to be had. It is quoted at $24.50@$25, Pittsburg. It would be difficut to get prompt iron at those figures, and then only in small quantities. The steel trade is also very quiet, but prices are firm. Sales are being made of billets for next year at $36 and for prompt shipment the price remains at $37. All lines continue strong except sheets, which have been dull for several weeks, but there are some prospects of an improvement. There are no indications that the cost of sheet bars will fall below $36 for next year, and may be higher. Spelter is a shade stronger and galvanized sheets will likely soon stiffen in price. For prompt shipment sheet bars are difficult to get at $38, and it is not improbable that this may be the price for next year. There is an unusually bright outlook for structural material, owing to the number of buildings contemplated and the many new industrial plants that are being erected. The prices are unchanged but firm. The plate market, while it cannot be considered any weaker than since the last report, is not as strong as other lines. The demand for pipes and tubes continues to be good, and the outlook for business for next year never was better. A good export trade is expected, owing to the recent advance in prices in England. The prices of old material are high on account of the scarcity and the continued good demand. Old steel rails, mixed lengths, are quoted at $22@$23, and old iron rails $29@$31. If the business for 1900 approaches the volume of the present year, prices will undoubtedly reach the high point from which they are now declining.

Pig Iron.—The sales made during the week aggregated 25,000 tons of Bessemer for delivery up to July 1st, at $24 in the Valleys. The price for next year at Pittsburg is $24.90@$25.25. Buyers who held off in expectation of lower rates are beginning to place their orders. There is but little iron to be had for this year, and $25 is the quotation.

Steel.—The market is quiet, but prices are firm. No sales for this year were made during the week. The price for prompt shipment remains at $37 and $35.50@$36 is quoted for next year. Basic steel is quoted this week at $45. The steel plate market is unchanged.

Sheets.—The low prices continue and the limit has been reached. Better rates are predicted after the first of the year. The present demand is poor and low prices have not had the effect of forcing sales. No. 28 gauge, which had dropped to 2.90c., is quoted at 2.95@3c. Galvanized sheets are lower than last week and are quoted at 75 and 10% off, with a freight allowance of 15c.

Ferro-manganese.—Prices remain unchanged and the demand continues to be good. For large lots $100 is quoted and $125 is asked for small quantities.

New York. Dec. 15.

The iron market is generally easier and prices of some finished products continue weak. The volume of business is falling off as the time for taking stock draws near, while consumers await lower prices. In foreign business we note shipments of $36,000 worth of manufactured iron to Australia and recent shipments to Argentina include $11,000 worth of iron pipe and $108,000 worth of agricultural implements. We note also shipments of over $25,000 worth of metal-working machinery, $14,000 worth of iron pipe, and $10,000 worth of mining machinery to England and $20,000 worth of mining machinery and $14,000 worth of steel rails to South Africa.

Pig Iron.—While the market is spoken of as easier, there does not appear to be any weakness in prices. There is less pressure for iron from buyers, but furnaces are sold well ahead and New York agents are apparently satisfied with the outlook. We quote for delivery to July, 1900: Northern brands, tidewater delivery: No. 1 X foundry, $25.50@$25.75; No. 2, $24.25@$24.75; No. 2 plain, $23.25@$23.75. Southern brands, New York delivery: No. 1 foundry, $23.25@$23.75; No. 2 foundry, $22.25@$22.50; No. 1 soft, $22.25@$22.50; No. 2 soft, $21.25@$21.50; No. 3 foundry, $21.50.

Warrant irons have fluctuated somewhat during the week. Alabama No. 2 foundry has been $16.85; No. 3, $15.65@$15; No. 4, $14.85@$14.50; gray forge, $15.20@$15.

Bar Iron and Steel.—The market for bars has relaxed just a trifle. We quote refined iron as high as 2.35c. on dock, and common 2.15c. Soft steel bars, 2.50c.

Plates.—Mills are looking for orders and prices are coming down. As yet they have not come down enough to bring many buyers. We quote for large lots at tidewater: Tank, ¼-in. and heavier, 2.75c.; tank, 3/16-in., 2.85c.; shell, 2.95c.; flange, 3.05c.; marine, 3.15c.; firebox, 3.20c.; universals, 2.75c.

Steel Rails and Rail Fastenings.—Some new business has been taken by Eastern mills, most of it in fair-sized lots. We quote for standard sections $35@$36 f. o. b. Eastern mills. Smaller rails are quoted: 12-lb., $40; 16-lb., $40; 20-lb., $40; 30-lb. to 40-lb., $38; 40-lb. to standard, $37, with the usual advance for small orders. We quote angle bars, 2.45c.; fish plates, 2.40c.; spikes, 2.75c.

Structural Material.—Buying is lighter and probably will show no improvement till late in January. Prices are easier. We quote for large lots of steel at tidewater: Beams, 15-in., 2.45c.; tees, 2.45c.; channels, 2.45c.; angles, 2.45c.; with higher figures for prompt delivery and small lots.

Nails.—The prices for both iron and cut nails show a decline, with only a moderate demand. Cut nails in carload lots on dock are quoted at about $3.25 and cut nails $2.65.

METAL MARKET.

NEW YORK. Dec. 15, 1899.

Gold and Silver.

Gold and Silver Exports and Imports
At all United States ports in October and year.

	October.		Year.	
	1898.	1899.	1898.	1899.
GOLD.				
Exports	$1,279.926	$772,867	$14,061,849	$33,650.705
Imports	16,738,353	7,562,876	144,082,169	41,831,297
Excess	I. $15,458,427	I. $6,790,009	I.$130,020,320	I. $8,180,592
SILVER.				
Exports	4.512.827	4.985,519	43,946,327	43,723,941
Imports	2,553,444	2,193,125	23,652,668	24,917,220
Excess	E. $1,959,383	E. $2,792,385	E.$20,293,659	E.$18,806,721

This statement includes the exports and imports at all United States ports, the figures being furnished by the Treasury Department.

Gold and Silver Exports and Imports, New York
For the week ending December 14th, 1899, and for years from January 1st, 1899, 1898, 1897, 1896.

Period.	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	$14,000	$31,721	$535,906	$161,828	E $356,357
1899..	11,746,386	13,826,349	28,205,408	3,716,665	E. 22,408,780
1898..	8,600,024	98,157,691	33,023,503	3,109 952	I. 59,644,116
1897..	29,799,881	43,207,861	34,954,478	3,024 733	E. 18,521,765
1896..	40,743,498	76,607,861	35,762,416	3,601,040	I. 3,702,630

The gold exported went to the West Indies; that imported was in small lots from various ports. The silver exported went chiefly to London; that imported came from Mexico and the West Indies.

The United States Assay Office in New York reports the total receipts of silver at 30,000 oz. for the week.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	$ .47½	$ .49
Peruvian soles and Chilean pesos	.43	.45
Victoria sovereigns	4.85	4.88
Twenty francs	3.84	3.88
Twenty marks	4.74	4.79
Spanish 25 pesetas	4.78	4.82

Average Prices of Silver per oz. Troy.

Month.	1899.		1898.		1897.	
	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.
January	27.42	59.36	26.29	56.77	29.74	64.79
February	27.44	59.42	25.89	56.07	29.68	64.67
March	27.48	59.64	25.47	54.99	28.96	63.06
April	27.65	60.10	25.95	56.02	28.36	61.85
May	28.15	61.23	26.31	56.98	27.86	60.42
June	27 77	60.43	27.09	58.61	27.58	60.10
July	27.71	60 26	27.32	59.06	27.36	59.61
August	27.62	60.00	27.48	59.54	24.93	54.19
September	27.15	58.89	28.05	60.68	25.66	55.04
October	26.70	57.98	27.90	60.42	26.77	57.57
November	27.02	58.67	27.93	60.60	26.87	57.93
December			27.45	59.42	26.83	58.01
Year			26.76	58.26	27.55	59.79

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

Average Prices of Metals per lb., New York.

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1899.	1898.	1899.	1898.	1899.	1898.	1899.	1898.
Jan	14.75	10.99	22.48	13.87	4.18	3.65	5.34	3.96
Feb	18.00	11.28	24 20	14 08	4.49	3.71	6.28	4.04
March	17.54	11.98	23.82	14.38	4.37	3.72	6.31	4.25
April	18.43	12.14	24.98	14.60	4.31	3.63	6.67	4.26
May	18.25	12 00	25.76	14.52	4.44	3.64	6.88	4.27
June	17.93	11.89	25.85	15.22	4.43	3.82	5.98	4.77
July	18 33	11.63	29.63	15.60	4.52	3.95	5.82	4.66
August	18.50	11 80	31.53	16.23	4.57	4.00	5.65	4.58
Sept	18.46	12.31	32.74	16.03	4.58	3.99	5.50	4.67
October	17.76	12.41	31.99	17.42	4.575	3.78	5.32	4.98
Nov	16.93	12.86	28.51	18.20	4.575	3.70	4.64	5.29
Dec		12.93		18.30		3.76		5.19
Year		12.03		15.70		3.78		4 57

The price given in the table is for Lake Copper. The average price of electrolytic copper in January want

Imports and Exports of Metals.

Port.	Week, Dec. 13.		Year 1899.	
	Expts.	Impts.	Expts.	Impts.
***New York.**				
Aluminum.....long tons	.....	12	.....	14
Antimony ore... " "	.....	‡37	.....	1,597
" regulus.. " "	.....	‡45	.....	1,101
Chrome ore..... " "	.....	.....	.....	2,376
Copper, fine .. " "	1,250	605	57.907	26,037
" matte.. " "	393	.....	1,005	1,099
" ore..... " "	.....	2,598	.....	47,721
" ash..... " "	.....	15	.....	220
" sulphate " "	110	.....	11,737	.....
" other.... " "	.....	.....	.....	135
Cop-nickel matte " "	.....	.....	.....	53
Ferro-mangan'se " "	.....	.....	.....	278
Iron ore..... " "	.....	.....	.....	50
" pig, bar, rod " "	72	‡114	6,481	4,085
" pipe..... " "	1,309	.....	27,082	.....
" plates, sheets " "	...	.....	748	251
" other.. ..... " "	.....	.....	1,209	.....
Lead..... " "	1,115	500	53,205	51,565
" ore.. ..... " "	.....	250	.....	1,191
Manganese, ore. " "	.....	‡15	.....	6,455
Metals, old scrap " "	100	‡30	4,886	4,523
Composition... " "	.....	.....	6.886	255
Nails..... " "	1,008	.....	18,700	.....
Nickel ..... " "	30	.....	1,899	105
" Ore ..... " "	.....	.....	.....	4,071
§Railr'd material " "	59	‡30	7,466	4,013
Rails, old..... " "	.....	‡113	15,417	468
Spiegeleisen..... " "	.....	.....	.....	1,170
Steel bars, plates " "	91	‡241	40,683	16,688
" rails..... " "	626	.....	48,456	150
" hoops..... " "	.....	.....	831	100
" wire..... " "	293	....	38,293	1.225
" not speci'd. " "	145	‡52	25,630	11.869
Tin ..... " "	.....	150	.....	25,923
" dross or ashes " "	.....	.....	63	.....
" and black plates " "	.....	‡679	.....	34,823
Zinc..... " "	.....	.....	272	358
" dross..... " "	.....	.....	437	.....
" ashes, skim " "	.....	.....	2,143	299
" ore..... " "	.....	.....	9,919	.....
" oxide..... " "	55	.....	4,194	283
†Baltimore.				
Alumina ..... bags	.....	.....	.....	3,479
Antimony regulus...casks	.....	.....	.....	286
Chrome Ore.....long tons	.....	.....	.....	2,300
Copper, fine..... " "	1,185	150	35,301	2,644
" matte... " "	.....	.....	.....	.....
" sulphate " "	10	.....	1,587	.....
" pipe..... " "	....	.....	100	.....
Ferro-manganese " "	.....	.....	.....	2,163
Ferro-silicon.. " "	.....	.....	184	96
Iron pig, bar etc. " "	.....	357	1,233	8,769
" ore..... " "	.....	15,190	.....	262,717
" pyrites.... " "	.....	2,340	.....	49,424
Manganese ore.. " "	.....	4,000	.....	77,613
Metals, old & Rails " "	.....	200	4,604	251
Nails ..... " "	.....	21	741	.....
Pipe, iron & steel " "	.....	212	13,960	.....
Spiegeleisen.. " "	.....	.....	.....	1,337
Steel, bars, pl'es.. " "	.....	326	36,079	.....
" wire ..... " "	.....	7	1,532	60
" rails..... " "	5,480	.....	73,473	276
" not specified.. " "	45	.....	2,943	23
Tin..... " "	.....	.....	563	.....
" and blackplates " "	.....	61	.....	2,865
" other..... " "	.....	.....	43	.....
Zinc..... " "	.....	.....	25	5
" dross, skim. " "	.....	.....	362	.....
" oxide..... " "	.....	.....	19	.....
***Philadelphia.**				
Antimony ....long tons	.....	.....	.....	10
Chrome ore ... " "	.....	.....	.....	3,060
Copper, fine..... " "	5	.....	540	.....
" ore..... " "	.....	.....	.....	36,507
" old..... " "	.....	.....	.....	11
Ferro-manganese " "	.....	.....	.....	1,572
Ferro-silicon.... " "	.....	.....	.....	160
Iron, pig..... " "	.....	11,240	.....	6.430
" ore..... " "	.....	‡6,896	.....	280,979
" pyrites..... " "	.....	.....	.....	10,153
Manganese ore.. " "	.....	.....	.....	86,561
Steel sheets.... " "	.....	.....	.....	510
Spiegeleisen..... " "	.....	.....	.....	2,120
Tin..... " "	.....	.....	.....	1,070
" and black plates " "	.....	.....	.....	1,547
Zinc dust..... " "	.....	.....	.....	10
" ore.... .. " "	.....	.....	3,093	.....

Total United States.§§

Articles.	October.		Jan.—Oct.	
	Expts.	Impts.	Expts.	Impts.
Antimony.. .. long tons	....	117	8	1,29
" ore.... " "		98		778
Copper fine " "	10,293	3,737	84 749	23,903
" sulphate.. " "	165	.....	11,800	.....
" ore & matte " "	342	12,717	4,347	19,916
Iron, pig & bar.. " "	14,182	7,025	218,102	43,534
" ore..... " "	1,193	72,931	22.283	498,330
Iron & steel plates " "	6,124	1,191	54,263	4,319
Iron & steel rails " "	37,273	795	223,270	1,918
" " wire " "	11,369	149	97,826	2,147
Steel, billets, rods, etc..... " "	3 006	3,258	66,726	25,282
Lead, pigs, bars & old ..... " "	3	1	49	208
Lead in ore..... " "	4,598	4,941	56,969	69,209
Nails, cut..... " "	483	.....	8,162	.....
" wire ..... " "	2,206	.....	24,265	.....
Tin ..... " "	33	1,777	362	29,294
" & black plates " "	19	5,769	242	48.751
Zinc .. .. " "	39	174	5,803	1,078
" ore ..... " "	3,972	.....	21,259	.....

*New York Metal Exchange returns. †By our Special Correspondent. §Not specified. ‡Week ending Dec 1st §§ Monthly returns of the Treasury Department.

The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, ¾c. a lb. Lead, 1½c. a lb. on lead in ores; 2½c per lb. on pigs, bars etc.; 2½c. on sheet, pipe and manufactured forms. Nickel, 6c. per lb. Quicksilver, 7c. per lb. Spelter or zinc, 1½c. per lb. in pigs and bars; 2c. on sheets, etc. Copper, tin and platinum are free of duty.

14.26c.; in February it was 17.02c.; in March, 16.35c.; in April, 17.13c.; in May, 17.2 c.; in June, 16.89c.; in July, 17.099; in August, 17.42c; in September, 17.34c.; in October, 16.94c; in Novemb r, 16.49c.

Financial Notes of the Week.

Complaints of money stringency continue to be made in the speculative markets, and stocks are generally weak. General business, however, is remarkably active for the closing month of the year, and there is very little complaint among manufacturers and merchants, except of difficulty in getting out material in time to fill orders. There is little probability of gold imports at present, though the increase of the Bank of England rate to 6 per cent. shows that it was thought necessary to take some precautions. On the whole it is quite as profitable to keep balances abroad just now as to transfer gold at this season. On Wednesday and Thursday there was some wild selling of trust stocks on Wall Street, with falling prices.

The silver market has remained very steady and firm at unchanged quotations. The demand for China is absorbing all offerings for spot or future sales.

The statement of the United States Treasury on Wednesday, December 13th, shows balances in excess of outstanding certificates as below, comparison being made with the statement of the corresponding day last week.

	Dec. 6.	Dec. 13.		Changes
Gold	$238,065,588	$243,296,704	I.	$5,231,116
Silver	9,768,425	9,692,458	D.	75,967
Legal tenders	15,549,813	15,548,458	D.	1,355
Treas notes, etc.	1,210,883	1,153,335	D.	57,548
Totals	$264,594,709	$269,690,955	I.	$5,096,246

Treasury deposits with national banks amounted to $82,380,919, a decrease of $410,354 during the week.

The statement of the New York banks—including the 63 banks represented in the Clearing House—for the week ending December 9th, gives the following totals, comparison being made with the corresponding weeks in 1898 and 1897:

	1897.	1898.	1899.
Loans and discounts	$907,725,300	$762,309,300	$681,464,300
Deposits	675 169,900	796,788,100	744,085,500
Circulation	15,854,200	16,385,300	16,411,300
Reserve:			
Specie	103.879,900	161,066,500	143,969,100
Legal tenders	83,800,000	54,873,800	48,911,800
Total reserve	$187,679,900	$215,940,300	$192,880,900
Legal requirements	168,792,475	199,197,000	186,021,375
Balance, surplus	$18,887,425	$16,743,300	$6,859,525

Changes for the week, this year, were decreases of 3695,500 in loans and discounts, $3,992,500 in deposits, $69,600 in circulation, $1,345,400 in specie, $1,329,900 in legal tenders, and $1,677,175 in surplus reserve.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings of the corresponding dates last year:

	1898.		1899.	
Banks.	Gold.	Silver.	Gold.	Silver.
N.Y. Ass'd	$161,066,500	.....	$143,969,100	.....
England	156,253,715	.....	153,985 970	.....
France	365,900,300	$242,395,760	377,437,090	$233,530,465
Germany	130,590,000	67,270,000	120,090,000	61,860,000
Spain	55,310,000	32,790,000	68,000,000	70,880,000
Aus.-Hun	177.040 000	62,355,000	194 435,000	60.530,000
Neth'l'ds	21,570,000	33.530,000	18,775 000	29,385,000
Belgium	15,365 000	7,685,000	14.550,000	7,275,000
Italy	74,896,000	11,650,000	77 255,000	7.470.000
Russia	497,615,000	18,475,000	439,010,000	23.765,000

The returns of the Associated Banks of New York are of date of December 8th, and the others are of date of December 7th, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold only.

Shipments of silver from London to the East for the year up to November 30th, 1899, are reported by Messrs. Pixley & Abell's circular as follows:

	1898.	1899.	Changes.	
India	£3,978 365	£4.809,725	I.	£831 360
China	577.939	1,265,978	I.	688,009
The Straits	365,541	269,506	D.	96,035
Totals	£4,921,875	£6,345,209	I.	£1,423,334

Arrivals for the week, this year, were £194,000 in bar silver from New York and £26,000 from Australia; total, £220,000. Shipments were £60,000 in bar silver to Bombay.

Indian exchange is easier and there has been less demand for Council bills in London, though the price continues steady at 16.09d per rupee. There has been again some buying of silver in London for India and more for China.

Other Metals.

Daily Prices of Metals in New York.

December	Sterling Exchange.	Silver. Fine oz. Cts.	Silver. London. P'nce	Copper. Lake cts. ₩ lb.	Copper. Electrolytic. ₩ lb.	Copper. Lond'n standard £ ₩ ton.	Tin, cts. ₩ lb.	Lead cts. ₩ lb.	Spelter, cts. ₩ lb.
9	4.86½	59½	27¼	16⅜	16⅛	.....	27	4.65	4.80
11	4.86½	59½	27¼	16⅜	16	73 0 0	26¾	4.65	4.80
12	4.86⅛	59½	27¼	16⅞	15¾	72 10 0	24¾	4.65	4.77½
13	4.86¾	59½	27¼	16⅜	15⅞	72 5 0	25½	4.65	4.80
14	4.86¾	59¼	27¼	16⅛	15⅝	72 17 6	25	4.65	4.80
15	4 87¾	59¼	27¼	16⅛	15⅛	72 10 0	24⅞	4.65	4.77½

The quotations given for electrolytic copper are for cakes, ingots and wirebars; the price of electrolytic cathodes is usually 0.25c. lower than these figures.

Copper.—The disturbance in the financial markets both here and abroad has no doubt had its effect on this article, much lower prices having been established therefor since we last went to press. Holders showed more disposition to realize than they have done for some time past, while on the other hand, manufacturers, owing to the approaching turn of the year, have been very reluctant to enter into any further deals. Thus very little business has been transacted. We quote the market at the close, 16⅜c. for Lake; 15⅞c. for electrolytic in cakes, bars or ingots, and 15⅝c. for cathodes.

The fall in copper at present, as stated above, is largely due to the excited condition of the market abroad. There is no doubt that copper has been too high for the best interests of all concerned, and the present reduction, or perhaps a still further one, would leave the price nearer its normal and healthy level. There is no occasion for any feeling of alarm or panic, since the market—outside of a few speculative interests—is perfectly sound. Demand for consumption is good, and all the copper offered can be taken without trouble.

The London market shows less change, at least so far as the speculative kinds are concerned, the market for which opened at £73, thus but slightly lower than that at which it closed last week. It is true, it had since then declined to £72 5s., but recovered most of the loss, advancing on Thursday to £73, and closing at £72 10s. for spot, and £70 10s. for 3 months.

For refined and manufactured we quote: English tough, £76@£76 10s.; best selected, £77 @£77 10s.; strong sheets, £81 10s.@£82; India sheets, £80 10s.@£81; yellow metal, 6⅝d.

Tin has been subject to wild fluctuations, the week opening with the market at about 27c., and declined gradually to 24½c., from which, however, there was a recovery to 25¼c., the close being 25c.

The fall in prices looks large but cannot be considered at all alarming. It is simply the reaction from the speculation of the past few months, which carried prices to a dangerously high point—a figure which could not be maintained for any length of time.

In the London market, the movements were, if anything, still more erratic, the market having closed on Friday of last week at £120, opening on Monday at £115; on Tuesday at £110, closing that day at £107 10s., but recovered on Wednesday to £112 15s. and declined on Thursday to £111, closing at £109 for spot, and £109 15s. for 3 months prompt.

Lead.—The market continues very firm. The demand is unprecedentedly active for this season of the year, and if it continues so, it is likely to create a shortage of supplies which may bring about still higher prices. We quote the market 4.65c. New York and 4.55c. St. Louis.

The European market is unchanged, Spanish lead being still quoted £17 7s. 6d. and English £17 10s.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: Lead is strong and higher. Latest sales are on the basis of 4.60c. Demand is fairly active.

Spelter.—The improved tone, of which we made mention last week, has been maintained, there having been a very active demand, both in the spelter and ore markets. The quotations at the close are 4.75@4.80c. New York and 4.55@4.60c. St. Louis.

The market abroad has scored another advance, the quotation now being £20 7s. 6d. for ordinaries and £20 12s. 6d. for special brands.

Antimony.—No change. Quotations remain 10½@11c. for Cookson's; 9¾@9⅞c. for Hallett's; 9½@9⅝c. for U. S. Star.

Nickel is firm and demand very brisk. Quotations are firm at 40 and 45c., according to size of order.

Platinum.—Demand is good, and prices are firmer. In large lots we quote $17.75, and for smaller quantities, $18 per oz., in New York.

For chemical ware (crucibles and dishes), best hammered metal, we quote as follows: In lots of 250 grams or more, 67½c. per gram, and for smaller quantities, 70c. per gram; unmanufactured platinum will be supplied in same quantities at 2c. less per gram.

Quicksilver.—The New York price is unchanged at $51 per flask for large lots. Smaller quantities sell at $52.50@$54. The London quotation is £9 12s. 6d., with the same price named from second hands.

Quicksilver receipts at San Francisco were 2,372 flasks; for the 11 months ending November 30th they were 21,739 flasks, against 20,945 in 1898 and 16,037 in 1897. For the 11 months shipments by sea from San Francisco were: Australia, 365 flasks; China, 4,000; Siberia, 2; South America, 10; Central America, 1,630; Mexico, 3,456; British Columbia, 43; New York, 188; total, 9,624 flasks, against 5,769 last year. Shipments overland by rail and direct from the mines are not reported.

The Minor Metals.—Quotations are given below for New York delivery:

	Per lb.		Per lb.
Aluminum.			
No. 1, 99% ingots	35@37c.	Bismuth	$1.60
No. 2, 90% ingots	31@34c.	Magnesium	$2.75@$3
Rolled sheets	38c. up	Phosphorus	40@50c.
Alum.-bronze	20@23c.	Tungsten	70c.
Nickel-alum	33@39c.	Ferro-tungsten, 60%	60c.

Variations in price depend chiefly on the size of the order.

LATE NEWS.

The coroner's jury investigating the disaster in the coal mines at Carbonado, Wash., on December 13th rendered the following verdict: "We find that the 31 men [giving their names] came to their death by an explosion of gas from some unknown cause. We find that the Carbon Hill Coal Company used due diligence to keep the mine free from gas for the safety of its employees, and has complied with the State mining law, and we attach no blame to the said company."

The foreign merchandise trade of the United States for the 11 months ending November 30th is reported by the Treasury Department as follows:

	1898.	1899.
Exports	$1,117,695,672	$1,152,190,465
Imports	579,825,309	732,401,721
Excess, exports	$537,870,363	$419,788,744
Add excess of exports, silver		20,042,673
Total		$439,831.417
Deduct excess of imports, gold		12,192.818
Net apparent balance		$427,638,599

The increase in merchandise exports this year was $34,405,793, and there was an increase of $152,576,412 in imports.

(From Our Special Correspondent.)

Pittsburg, December 15th.—As indicated last week, the price of coal has been advanced by both combinations. The new rates announced to the dealers to-day by the Pittsburg Coal Company, the combination of railroad coal operators, are as follows: For 1½-in. coal, $1.30 a ton; 1¼-in., $1.25; ¾-in., $1.15; run of mine, $1.05; 1¼-in. nut, $1; slack, 75c. These prices are for coal on board cars at the mines, and, with the freight added, fixes the price at Pittsburg. The Monongahela River Consolidated Coal and Coke Company, the combination of river coal operators, has also advanced prices and the rates for thick vein coal are the same as those of the railroad combination, but the river coal is delivered in Pittsburg, and is, therefore, sold at a less rate, the difference being the freight rate. For thin vein coal 13c. a ton additional is charged.

(From Our Special Correspondent.)

Boston, Mass., December 15th.—The stock market yesterday and to-day has been excited over rumors about trouble at the Globe National Bank. It had been known generally that the interests of the former president, Charles H. Cole, in various mining and similar companies, had been regarded with disfavor, and it was hoped that, with his retirement from the presidency, which occurred some weeks ago, the bank would be perfectly able to carry on its business without any trouble resulting from its connection with these various companies. The sharp decline not only in the shares alluded to, but in those of other mining companies identified with the name of A. S. Bigelow, a director of the Globe Bank, and president of the Boston & Montana, Tamarack, and Osceola Companies, added to the uneasiness.

The United States Oil Company recently declared a dividend of $1.25 per share, being an increase of quarterly payments, yet in face of this the stock has declined.

December 14th Boston & Montana stock dropped $25 to $250, while United States Oil, which closed December 13th at $34, sold at $25, ex-dividend.

The general market has been uneasy and extremely weak, good judges, indeed, fearing a general collapse in coppers. It is announced this morning that the Globe Bank is perfectly sound, but that the Clearing House Association has decided to advance it $3,500,000 as a precaution.

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 720.)

New York. Dec. 15.

Heavy Chemicals.—Market quiet, as contracts for soda ash have been nearly all booked, while occasionally sales are reported for immediate shipment at advanced prices. Bleaching powder was sold by second hands at $2½@$2¾ per 100 lbs., and for nearby shipments, $2⅝@$2½. The agents of the United Alkali Company are sold out for 3 months ahead. Imports were very light this week, as were also the receipts of domestic soda ash at this port.

Articles.	Domestic.		Foreign.
	F.o.b. Works.	In New York.	In New York.
Alkali, in bags.	80@85c.	95@1.00	95@1.05
Caustic Soda, high test....	$1.85@2.00	$2.00@2.05	$1.95@2.00
98% powd....	.....	3 12½@ 3.50	.....
60@74 % pwd	.....	2.50@ 2.62½	.....
Sal Soda	60@70c.	.....	67½@72½c.
" conc.	1.30@1.75	.....	1.60@1.65
Bicarb Soda..	1.25@1.37½	.....	2.25@2.37½
" " extra	3.25@3.50	.....	
Bleach. Pdr., Eng. prime..	.....	.....	2.37½@2.50
other br'nds.	.....	.....	2 15@2.25
Chl. Pot cryst	.....	8 25@9.00	9.25@9.37½
" powd.	.....	9,12½@9.37½	9.50@9.62½

Prices are generally for large quantities, and in many cases depend upon make, test and package.

Acids.—Acetic continues strong, sulphuric and muriatic showed further contracting, and mixed acids are in good request. Blue vitriol is also in better demand for export, while oxalic is quiet. English benzoic acid, which costs 10½@11c. per lb. to import, has been advanced to 12c. for large lots. For carbolic acid, which costs 20c. per lb. laid down here, importers ask up to 26c. in drums for large quantities, and up to 30c. in bottles.

Quotations are in large lots delivered in New York and vicinity, per 100 lbs. unless otherwise specified.

Acetic, No.8.....	$1.62½@1.75	Nitric, 42°.....	4.75@ 5.00
Blue Vitriol, best	5.00@5.25	Oxalic	5.75@ 6.00
Muriatic, 18°.	1.20@ 1.25	Sulphuric, 66°....	1.20@ 1.25
Muriatic, 20°.	1.35@ 1.40	Sulphuric, 60° ..	1.05@ 1.10
Muriatic, 22°.....	1.50@ 1.55	Bulk 50° ton....	16@17,00
Nitric, 36°	3.87½@4.12½	Sulphurous, 100%	
Nitric, 38°.....$4.12½@4.37½		SO_3 anhydrous.	8.00@10.00
Nitric, 40°.....4.37½@ 4.75			

Brimstone.—Imports at New York were 4,982 tons. Spot best unmixed seconds are quoted at $21@$21¼ per ton, and shipments are about the same, with thirds $2 less per ton. In October the shipments from Sicily to all countries amounted to 38,940 tons, as against 30,209 tons in the same month last year. Stocks in Sicily November 1st were 265,129 tons, showing an increase of 30,914 tons over last year.

Pyrites.—More charters are reported from Huelva, Spain: 1,657 tons to Savannah or Charleston at 12s., December sailing; 1,691 tons to Philadelphia, 10s.; 1,994 tons to Port Royal or Charleston, 12s. 6d.; 1,344 tons to north of Hatteras, 12s. 6d.; and 1,270 tons to Charleston, 13s., December. Domestic pyrites are moving in fair lots on contracts. Prices are firm.

We quote American pyrites as follows: Mineral City, Va., lump ores, $3.25 per long ton (basis 42%), and fines $3; Charlemont, Mass., lump, $5.50, and fines $4.75; Pilley's Island, lump, $6.50, and fines $4.50 per long ton, delivered in New York. Spanish pyrites, 12@14c. per unit, according to percentage of sulphur contents, delivered ex-ship New York and other Atlantic ports. Spanish pyrites contain from 46% to 51% of sulphur; America, 42% to 44%, and Pilley's Island, N. F., 50%.

Fertilizing Chemicals.—The South is still buying the leading ammoniates in a good way. Sulphate of ammonia, gas liquor, is firm for shipment. More is doing in the potash salts, of which we imported this week at New York, 5,850 bags muriate, 2,155 bags sulphate, 6,050 bags manure salt, and 679 tons crude kainit.

Articles.	F. o. b. Wks.	In N. Y.
Potash, muriate, 80@85%, 100 lbs.	.....	$1.78
" " 95% "	.....	1.81
" sulphate. 90% "	.....	1 98½
" " 90% "	.....	2.10½
" d'ble m're salt, 48@53% 100 lbs.	.....	66c.
" " " 30% "	.....	89c.
" kainit, 12.4%. long ton.	.....	8.70@8 95
" sylvanit.. per unit.	.....	37@38c.
Sulph. Am., gas (25%)....100 lbs.	.....	2 90@2.92½
" " bone ..... "	.....	2.77½@2.80
Blood, dried, h-gr. Chi. per unit	1.72½@1.75	.....
" " " N.Y., "	.....	1.85
Azotine ..... "	1.75@1.80	1.80@ 1.85
Bone black, diss., 17@18%...ton	.....	16.00@16.50
Fish scrap, acid ..... "	10.50@11.00	12 50
" " dried ..... "	19.50@20	21.50
Tankage h. gr.. Chicago.... "	14.50@15.00	21.00
" concentrated.. unit.	1.45@1.50	1.90@1.9
" bone.. .... ton.	.....	20.00@21.00
Bone, steam gd, domestic.. "	.....	21.00@23.00

The quotations on potash are on the basis of foreign in voice weights, tares and analysis, in quantities of not less than 500 tons bulk salts or 50 tons concentrated salts.

Nitrate of Soda.—Spot market firm and higher. No arrivals this week. Spot is worth $1.85 per 100 lbs., and futures from $1.65@$1.75, according to position. The coast market is higher, owing to increased demand from Europe. Freights are very firm. Should the fertilizer makers increase their demand within the next 3 months, higher prices will rule. The shipments for November from the west coast of South America amounted to 147,000 tons, against 210,500 tons last year, and of this total 6,000 tons went to the United States, as against 9,000 tons in November, 1898. The total shipments to Europe and America for the 11 months were 1,187,000 tons, against 211,000 tons last year, showing an increase of 976,000 tons. The loadings on December 1st, 1899, were 127,500 tons, of which 9,500 tons were spoken for the United States.

Phosphates.—Notwithstanding the high freight rates there have been a number of charters for the foreign market, including 1,357 tons from Tampa to Bordeaux at 21s., December; 1,538 tons from Fernandina to Zwynedricht at 17s., January; 999 tons from Tampa to Sydney, New South Wales, 28s. 6d., December; 1,536 tons from a Southern port to the United Kingdom, or Continent, at private terms; 1,241 tons from Fernandina to Hamburg, at private terms; 1,348 tons from Coosaw to St. Nazaire at private terms. There have also been two charters, of 522 tons from Ashley River, S. C., and 881 tons from Port Royal to Baltimore, at $3 each. The shipments from Fernandina in November amounted to 10,075 tons, making a total of 225,547 tons for the 11 months, this year. Shipments of Tennessee rock from Pensacola, Fla., in November, aggregated 9,370 tons, as against 14,888 tons in October.

In October the shipments of high grade Florida phosphate rock amounted to 36,694 tons, all to foreign ports. In the 10 months ending October 31st, the shipments aggregated 397,201 tons, against 307,755 tons in the same time last year. Auchincloss Brothers distribute these shipments as follows: To United Kingdom ports, 28,847 tons (25,762 tons in 1898); Baltic, 112,554 tons (against 91,686 tons); Continental, 242,416 tons (against 175,894 tons); Mediterranean, 7,711 tons (against 10,771 tons); Australia, Japan, and domestic ports, 5,673 tons (against 3,642 tons). The November shipments of high grade Florida rock from Savannah, Ga., were 15,117 tons, making a total of 92,299 tons for the 11 months from this port.

In the foreign market Florida high grade rock for 1900 shipment is easier, while the other American phosphates are unchanged.

Latest quotations for the European market, c. i. f. United Kingdom or North Sea ports, are as follows: Florida high grade rock (77@80%), 8¾@8⅞d. ($13.65@$14 per long ton); Florida pebble (68@73%), 7¼d. ($9.80 per ton); Florida Peace River (58@63%) 7¼d. ($9.00 per ton), Tennessee high grade rock (78@80%), 7¼d. ($11.45 per ton); Algerian (63@70%) rock, 7¼d. ($9.38 per ton), and 58@62% rock, 6¾d. ($7.80 per ton).

We quote: Florida high grade, 78@80% rock, $9.50@$10 per long ton f. o. b. Fernandina. The freight rate to New York is about $2 per ton. Florida land pebble, 68@73%, $7@$7.50 per ton, delivered in New York. Florida Peace River, rock, 58@63%, $4.50 per ton f. o. b. Punta Gorda. South Carolina crude rock, $4.25@$4.50; hot-air dried, $4.50@$5 per long ton f. o. b. Fetteressa, S. C. Tennessee, 78% rock, $4@$4.50 f. o. b. Mt. Pleasant, and 75% rock, $2.75@$3 f. o. b. High grade Tennesse rock, ex-vessel New York, $9 @$10 per ton. Hickman County blue-gray rock, 65%, and not over 3% iron and alumina, $2.50@$2.75 per ton f. o. b. mines. Concentrated phosphates, 13@15% av. P_2O_5 60c. per unit at sellers' works. Acid phosphates, $6.25 per ton for 14% in bulk, f. o. b. Charleston, S. C.

MINING STOCKS.

Complete quotations will be found on pages 747 and 748 of mining stocks listed and dealt in at:

Boston.	Philadelphia.	London.
Colo. Springs.	Spokane.	Mexico.
Denver.	Salt Lake.	Paris.
New York.	San Francisco.	Toronto.

New York. Dec. 15.

The copper shares have been weaker, and liquidation by short interests in Amalgamated was large. This stock sold down from $83½ to $77¼, the lowest price yet. A sympathetic drop occurred in Anaconda, which sold off from $43 to $37½, the lowest to date. Tennessee sold at $11 and Arizona Lead at $10, while the others were featureless.

American Smelting and Refining was also weaker, the common shares changing hands at $38½@$34¼, and the preferred at $89@$85. Sloss-Sheffield Steel and Iron common brought $30½ @$32½, and the preferred $72, as compared with @$32½, and the preferred $70@$72, as compared with $35@$37 and $73½ last week. Flemington Coal and Coke sold at $26½@$27. Tennessee Coal and Iron was depressed, dropping to $78, the lowest price for a long time. This fall, it is said, was due to forced liquidation. Federal Steel showed heavy trading, and to-day is selling at $53¾ for common, and $75⅞ for the preferred shares. At a recent meeting a 3% dividend was declared on the preferred stock, and it is claimed there is enough money in the treasury to pay a dividend on the common shares in January next. Standard Oil receded from $468 to $463.

In the Colorado stocks Elkton, which has just announced a quarterly dividend of 3c. per share, sold at $1.15. Isabella, with dividend rumors afloat, sold at $1.25@$1.30. Jack Pot brought 60@56c.; Mt. Rosa, 40@41c.; Mollie Gibson, 23@22c.; Anaconda, 35@40c.; Argentine Juniata, 17½@18½c.; Cripple Creek Consolidated, 16@14½c.; Work, 31c.; and Iron Silver of Leadville, 55c.

Quicksilver common of California made sales at $2, or 25c. less than last week. Ontario of Utah was off 50c. at $9, and Moulton of Montana sold at 30c.

In the Comstock section Best & Belcher sold off 7c. at 43c.; Mexican, 44c.; Yellow Jacket, at 15c., and Potosi at 29@28c.

The International Zinc Company, Limited, of Joplin, Mo., capitalized at $1,000,000, divided into $1 shares, is offering 300,000 shares at 75c. The property controlled was reported last week by our Joplin correspondent as having been purchased by the Colonial Zinc Company, Limited, of New York, for about $300,000.

Auction sales were 100 shares American Enamel Brick and Tile Company at $10.

Boston. Dec. 13.

(From Our Special Correspondent.)

The market for the copper stocks continues dull and narrow, with light transactions and a downward tendency in prices. The same feeling extends all through the list, and mining shares of all kinds are depressed. The bull "pointers" put out by interested parties have no effect on the public.

Of course, tight money is blamed for this, and there are appeals to the Treasury for aid. Manufacturers and merchants seem to have no trouble in getting the money they need, but speculators who are trying to carry stocks on borrowed money have a hard time of it. The cause of the present dullness goes a long way back of any temporary money stringency. Boston is trying to recover from the big financial spree of a few months ago. People who bought then for speculation cannot sell out except at a loss they will not submit to unless they are obliged to, while those who bought for investment are loaded down with stocks that may bring them some return by-and-by but are hard to carry now. Of the innocents who believed that Butte and Arcadian would go to $200, Montana to $600 and Amalgamated to $1,000 by the end of the year it is hardly worth while to speak. To-day the market was less active. Prices were higher on short covering, especially in those mining shares which were sold freely yesterday. Montana, after losing $10 to $270, rallied to $283; Tamarack, up $15 at $200; Arcadian, up $1 at $25; Quincy, up $5 to $140, later $138; Butte, $53½, up $6; Amalgamated, $80, up $½; Montana Coal, $7¼, off $1¼; United States Oil, up $2 at $36, later $35; Parrot, up $2 at $37, later $36; Isle Royale, $26, up $3; Cochiti, $13¼, up $¾; Bingham, $11; Zinc, $25; Arnold, $5½; Adventure, $6; Wolverine, $36¾; Santa Ysabel, $7⅞; Copper Range, $32; Centennial, $20, up $1; Utah, $30, up $1; Merced, $8½; Elm River, $5¼; Massachusetts, $9; Mohawk, $16; Gold Dredging, $9; Rhode Island, $5; Old Colony, $5, up $½; Osceola, $68, up $3; Old Dominion, $23½, up $2½, later $23; Dominion Coal, $47, up $½; New England Gas and Coke was $1 higher at $21½.

The 750,000 shares, $100 par value, of the Amalgamated Copper Company have been placed in the unlisted department of the Stock Exchange, and will be regularly quoted hereafter.

Salt Lake City. Dec. 9.

(From Our Special Correspondent.)

No change for the better is discernible in Utah mining shares. There is a growing lack of confidence in the way affairs are handled on the Exchange, which, added to the numerous assessment propositions that were represented as better than self-sustaining, indicates that dullness will continue. A few new ore uncoverings of unquestioned moment would brighten the situation.

Ajax still markets good ore, but the shares sag. Bullion Beck holds up well; shipments indicate the usual dividend this month. Centennial Eureka minority share owners have been paid the $70 per share and the Utah Company has transferred its belongings; the new shares are to be dealt in on the Boston Exchange. Chloride Point droops. Daisy closes 2 points under last Saturday in spite of improved surface appearance of its chaotic affairs. Lively trading continues, but it has not a healthy look. Daly did business at an advance over last week. Daly West is higher and stronger; the third dividend of 20 cents will be paid December 20th. Dexter displayed a fair demand, but closes lower than last week.

Eagle-Blue Bell is a shade under last Saturday. Four Aces brought the threatened suit against South Swansea on Wednesday. The shares are lower, weak and losing favor. Grand Central ends the week in better form than for some time. The December dividend was passed

at directors' meeting on Friday, but increased shipments, the management avers, indicate an early resumption. Joe Bowers' weakness is owing to dissatisfaction over the proposed settlement with the Burnham folks. It is quite active at the lower figures. Little Pittsburg has levied another ½c. assessment. Mercur is softer, with lessening demand. Representations of enlarged production are not accompanied by inside support. Northern Light is a point lower; it would seem this is due to the latest find of high grade ore. Ontario resumes dividends this month, paying 10c., or $15,000, December 20th; shares are strong and there is a good demand around $9. South Swansea broke as a sequence of the suit started by Four Aces, but is recovering. About 80% of Star Consolidated shares have agreed to a voluntary assessment of 10c. At the stockholders' meeting the other day some of the largest owners showed undiminished faith in the property. Silver King paid the usual $50,000 dividend to-day.

San Francisco. Dec. 9.

(From Our Special Correspondent.)

The little spurt which followed the report of a strike of good ore in Consolidated California & Virginia ground has passed over, and prices are generally lower again. Just how much was in the reports mentioned no one seems to know. Business was a little larger this week, but still mainly an inside business.

Some quotations noted are: Consolidated California & Virginia, $1.90@$1.95; Ophir, $1@$1.05; Confidence, 84@86c.; Sierra Nevada, 59@60c.; Mexican, 46@48c.; Hale & Norcross, 40@41c.; Chollar, 18@19c. Some business was done in Standard Consolidated at $2.70@$2.80.

On the California Oil Exchange business was quite active, with prices generally well maintained. Tidal Wave brought $2.10@$2.20; Yukon, $2@$2.05; Anaconda, $1.10@$1.20; Parker Ranch, $1.15; Century, 90@95c.

On the opposition, the Producers' Oil Exchange, trading is also reported active. Among sales noted was 1 share Home at $425. Among other quotations were Blue Goose, $30; National, $10; San Luis, $5.50; Dominion, 40@45c.

Oil shares seem to be quite attractive to the public. There are some good producers on the list, but a majority of the stocks dealt in represent prospects only.

London, England. Nov. 29.

(From Our Special Correspondent.)

The South African mining stock market has been rather depressed this week, as city men seem to think that the campaign is not getting on fast enough and that operations in Natal have a temporary ugly look. Hardly any business of any sort has been transacted. West Australians and other mining shares have been dull with the exception of those in copper companies, which continue to be the most in genuine demand. Though South African shares on the market have been depressed and land exploration shares have been in the shade, it has been considered advisable by Mr. Cresceus Robinson and Mr. Gordon Forbes, prominent Rhodesian pioneers and promoters, to offer the shares of a new company—the Somerset Matabele Development Company, Limited—to the public. The capital is £250,000, of which £150,000 in shares goes to vendors and £60,000 is offered to the public for subscription, the remainder being held in reserve. The vendors also take £10,000 in cash. The properties to be acquired are gold propositions apparently averaging $15 to $20 to the ton and are scattered about in various parts of Rhodesia. There is very little information as to these properties given in the prospectus, and what little there is is stated candidly to be given by the vendors. It is entirely a question of personal knowledge of Mr. Robinson and Mr. Forbes and of whether their pardonable pioneers' enthusiasm has not outrun their calm, business-like judgment.

Great interest has been aroused in the South African market by the publication of an interim report of the Randfontein Estates Gold Mining Company, one of Mr. J. B. Robinson's companies. This company has for some months been mentioned in London as one of the most promising of the less developed properties on the Rand, and its expansion on a large scale has been expected. The report mentions that these extensions of development and plant are now arranged for and at the close of the war they will be actively proceeded with. I hear also that Mr. John Hays Hammond has left for America to arrange for the purchase of a large amount of machinery. As usual, patriotic Englishmen will be angry that large orders of this sort should go to America, but when a business Englishman is in a hurry for machinery he goes to the market where early delivery, coupled with efficiency, is guaranteed. I should not be surprised if the Randfontein order proves the biggest in its way that has ever gone to America.

A new company of considerable interest has been introduced this week to the London public, called the Briseis Tin Mines, Limited. The company has been formed to acquire some extensive tracts of alluvial lands in the Ringarooma District in Tasmania that have been worked locally on a small scale. Mr. Kayser, manager of the Mount Bischoff Mine, gives a very full report and estimates that there are some 6,000,000 cubic yards of alluvial that can be hydraulicked containing 1% of black tin. By provision of a systematic water supply there appears to be no difficulty in working all this deposit. The capital of the company is £600,000, of which £150,000 in cash and £360,000 in shares go to the vendors while £90,000 is reserved for working capital. The vendors are the Venture Corporation, Limited, which was responsible also for the flotation of Stratton's Independence. This comporation when started did badly, but Stratton's Independence has given it an excellent name in the City. The prospectus of the Briseis is drawn up in the same way as that of the Stratton, and certainly the prospect seems a hopeful one. The board is a practical one and includes directors of the Waihi, Mount Lyell, Broken Hill Proprietary and Stratton's Independence.

For many years now the London shareholder has been amused or otherwise by the continued failures and excuses for the same of the Golden Feather Company, Limited, that was started to operate river bed and alluvial deposits near Oroville, Butte County, California. These were originally brought to London by the redoubtable Col. MacLaughlin, of sporting fame, and for some years he managed the properties for the London shareholders. The acrobatic performances of the dam and the flume just as each season ended and the occupation of the succeeding season in getting them to once more behave themselves were for many years the comic element of the mining market. At last the shareholders began to think it was the Colonel who was at fault and not the dam or the flume, and some even suspected that he helped them in their deviations from rectitude. Anyhow, they got rid of him and started to work the properties independently. This happened in the spring of 1898, when a third reconstruction was resorted to, this time under the name of the Magalia Consolidated Gold Mines, Limited. After a year and a half the first report of the new company has just been issued. The directors say that the properties are valueless; though they contain gold, its occurrence is irregular and in very small quantities. They therefore propose to acquire a new property called the Golden Drift, not far off. Really the shareholders deserve success eventually and I can only hope that the Golden Drift will win them their money back.

Several times lately I have recorded the conviction of dishonest company promoters in London and have reported the admirable results of the public utterances of Lord Chief Justice Russell. The latest example of this activity on the part of the law and police in ridding London city life of its sharks, is to be found in the conviction of Edward Beall and his sentence to four years' penal servitude. This action was undertaken by the public prosecutor in connection with the flotation of the London & Scottish Loan and Discount Company, which was one of the hundred or so fraudulent promotions of Beall. The prospectus was proved to be full of lies and the method of conducting what business it had scandalous. Like all his other companies, it had no basis of business, but it existed only for the purpose of enabling Beall and his associates to sell worthless shares to greenhorns. Time after time actions for the return of subscriptions were commenced in the courts of law, but Beall would invariably consent to judgment. On three different occasions he filed petitions of bankruptcy when the amount of restitution was considerable. Beall was a lawyer and was struck off the rolls some years ago for irregular conduct. Whenever he came before court the judge recommended the public prosecutor to look into the case, but this was never done until now. The present Lord Chief Justice is a strong man and has done more to stir up the public prosecutor than any ten men living. Every honest man in London wishes "more power to his elbow."

Paris. Dec. 3.

(From Our Special Correspondent.)

The stock market has been somewhat agitated, but the fluctuations have been in both directions. The copper shares are higher, while the metallurgical shares are not so strong, and the South African stocks have again lost ground.

The Societe de Fives-Lille will pay no dividend for the fiscal year lately closed. Some of its transactions have been profitable, but the heavy losses on the contracts for the Linares-Almeri Railroad in Spain and the Heraclea Railroad in Asia Minor have absorbed all the profits on other orders.

The Compagnie Francaise des Metaux reports that the unfortunate operation for a fall in copper, which led to the resignation of the president and secretary, resulted in a loss of 898,117 fr. during the year ending June 30th, last. In addition to this, 206,641 fr. have been paid since the close of the year, making the total loss on the transaction 1,104,758 fr. Suits are pending against the ex-officials, who acted, it is claimed, in excess of their authority; but it is yet uncertain whether anything can be recovered. The losses absorbed about 90% of the profits for the year.

Negotiations are said to be pending for an amalgamation of the French Gold Mines Exploration Company and the French Bank of South Africa. M. Raphael Georges Levy, who is largely interested in both companies, is at the head of the movement.

A bill to authorize a further loan of 60,000,000 fr. for railroads in Madagascar has passed the Chamber of Deputies. The last 2½% loan for that colony is now selling at about 81 fr. on the 100 fr.

Certain of the agricultural party have asked for a bounty in some form on wheat exported. It appears that wheat now sells in Paris at only 2 fr. per 100 kgs. above the price in Bruxelles, although there is a duty of 7 fr. on imports into France.

Some time ago plans were made for enlarging the Paris Bourse by the erection of lateral wings to extend the colonnade at the rear of the building. That project appears to have been abandoned, and suggestions have been put forward for removing the Bourse to the Palais Royal. The garden, which is now waste, would afford ample space for a large rotunda, while the shops under the arcades, a great part of which are empty since the center of Paris has moved to the neighborhood of the Opera, might serve as offices for the agents-de-change and coulissiers. An exchange of buildings would have to be made, as the Palais Royal belongs to the State and the Bourse buildings to the city of Paris.

An unpleasantly strong feeling against both Great Britain and the United States undoubtedly exists in Paris; but this is being exaggerated in an unjustifiable way by some of our Boulevard journalists.

Azote.

DIVIDENDS.

Bunker Hill & Sullivan Mining and Concentrating Company of Idaho paid $21,000 on December 4th.

Elkton Consolidated Mining and Milling Company of Cripple Creek, Colo., quarterly of 3c. ($33,750), payable December. Total to date, $720,-711.

Golden Cycle Mining Company, Cripple Creek, Colo, $10,000, payable December 18th.

Little Tiger Mining Company, California, paid $7,500 on December 15th.

Orphan Belle Gold Mining Company, Cripple Creek, Colo., 9c. ($82,899), payable immediately. Total to date, $197,899.

MEETINGS.

NAME OF COMPANY.	Meeting.	Date.	Place of Meeting.
American Coal	Annual..	Dec. 28	1 Broadway, New York City.
Andes, Nev.	"	Dec. 18	309 Montgomery st, San Franc'o
Kennedy	"	Dec. 28.	404 Montgomery st, S Francisco.
Rabbit Foot, Utah	Special..	Dec. 18	206 So. W. Temp st., Salt Lake

ASSESSMENTS.

NAME OF COMPANY.	Location.	No.	Dlq.	Sale.	Amt.
Alliance	Utah	22	Dec. 1	Dec. 22	.10
Arrastraville	Cal..	4	Dec. 11	Jan. 3	.10
Brunswick Con	Cal..	13	Dec. 19	Jan. 17	.03
Con. New York	Nev..	16	Jan. 4	Jan. 25	.03
Four Aces	Utah	...	Jan. 1	.....	.05
Gould & Curry	Nev..	88	Dec. 27	Jan. 18	.15
Grape Vine Canyon	Cal	1	Jan. 8	Jan 29	.10
Joe Bowers Ext	Utah	4	Dec. 10	Dec. 30	.01
Lucky Bill	Utah	...	Nov. 29	Dec. 19	.02
Lulah Con	Utah	2	Dec. 5	Dec. 20	.00½
Molly Bawn	Utah	1	Nov. 29	Dec. 18	.01
National Con	Cal..	9	Nov. 27	Dec. 21	.10
New Imperial	Utah	1	Jan. 2	Jan. 20	.01
New Klondike	Utah	3	Nov. 27	Dec. 18	.01
Occidental	Nev..	34	Jan. 3	Jan. 24	.05
Opohongo	Utah	3	Dec. 14	Jan. 4	.01
Orr Water Ditch	Nev..	.	Dec. 11	.....	3.00
Sacramento Con	Utah	1	Nov. 18	Dec. 18	.00½
Sierra Nevada	Nev..	117	Dec. 7	Dec. 26	15
Thorpe	Cal	...	Jan. 2	....	.01
Yellow Jacket	Nev..	2	Dec. 26	Jan. 31	.15

STOCK QUOTATIONS.

NEW YORK.

NAME OF COMPANY	Location.	Par val.	Dec. 8. H.	Dec. 8. L.	Dec. 9. H.	Dec. 9. L.	Dec. 11. H.	Dec. 11. L.	Dec. 12. H.	Dec. 12. L.	Dec. 13. H.	Dec. 13. L.	Dec. 14. H.	Dec. 14. L.	Sales
Adams	Colo	$10	14	....	.14	....	.15	....	.14	....	....	....	....	....	....
Alamo	"	1	11⅜	....	.13	....	.11⅜	....	.12	....	.12	....	....	....	....
Alice	"	25	.4	....	.40	....	.40	....	.4	....	.40	....	....	....	....
Amalgamated C	Mont.	10	82.25	82.00	81 5	8 .50	80 13	80.00	81.00	80 50	79.5	79.25	88.25	78.00	....
Anaconda, c	"	25	43.00	41 50	41.50	40.25	40 13	9.25	39.88	38.13	38.75	37 50	38.50	....	26,535
Anaconda Gold	Colo	5	.42	....	.43	....	.40	....	.35	....	.37	....	....	....	4,500
Anchoria Lel	"	1	.50	....	.75	....	.55	....	.14	....	.74	....	....	....	....
Argentum-Jun	"	2	.18	....	.17	....	.17½	....	.17	....	.18⅜	....	....	....	1,900
Belcher	Nev	3	.25	....	.22	....	....	....	.18	....	.22	....	....	....	....
Best & Belcher	"	3	.43	....	.40	....	.40	....	.43	.36	.30	....	....	....	800
Breece	Colo	25	2 .0	....	2.0	....	1.85	....	2.85	....	2 00	....	....	....	....
Brit.Col.Copper	B. C	10	10 50	10.00	1 00	0.25	11.25	10.95	11.00	10 50	11.00	10.50	11 00	10.25	....
Brunswick	Cal	1	25	....	25	....	.2	....	.20	....	.22	....	....	....	....
Challar	Nev	3	.17	....	.15	....	.15	....	.10	....	.10	....	....	....	....
Comst'k T , st's	"	100	.04⅜	....	.03⅜	....	.03	....	.03	....	....	....	....	....	500
" " bon's	"	100	.03⅜	....	.03⅜	....	.03	....	.04	....	....	....	....	....	....
" " scrip	"	100	.06	....	.03⅜	....	.04	....	.04	....	....	....	....	....	....
Con. Cal. & Va	"	2½	1.65	....	2.8	....	1 60	....	1.70	....	1 55	....	....	....	700
Cr & Cr. Creek	Colo	1	.10	....	.11	1.75	.09	....	.10	....	.08	....	....	....	3,000
Crescent	"	10	.15	....	.1a	....	.12	....	.12	....	....	....	....	....	....
Cripple Cr. Con	"	1	.16	....	.15	....	.15	....	.14	....	1.5⅜	....	.15⅜	.15	3,000
Crown Point	Nev	3	.15	....	.15	....	.17	....	.15	....	.10	....	....	....	....
Damon	Colo	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Deadw'd Terra	S.Dak	25	.55	....	.55	....	.50	....	.50	....	.50	....	....	....	....
Dunkin	Colo	1	.08	....	.18	....	....	....	.08	....	.08	....	....	....	500
Elkton	Colo	1	1.15	....	1.17	....	....	....	1.15	....	1.165	....	1.17	1.167	2,600
Eureka	Nev	20	.30	....	.25	....	.25	....	.25	....	.25	....	....	....	....
Father de Smet	Dak	100	.18	....	.18	....	.10	....	.18	....	.08	....	....	....	....
Find ey	Colo	1	.13⅜	....	.12	....	.18	....	11⅜	....	.11⅜	....	....	....	....
Garf Con	"	1	.18	....	.19⅜	....	.19⅜	....	.19⅜	....	.19	....	.21	.19	....
Golden Age	"	1	....	....	....	....	.06½	.06	.06	.05⅜	.05⅜	....	....	....	6,500
Golden Fleece	"	1	.28	....	.30	....	.25	....	.28	....	.34	....	.34	.33⅜	1,500
Gould & Curry	Nev	3	.1a	....	.10	....	.12	....	.10	....	.10	....	....	....	....
Hale&Norcross	Nev	3	.35	....	.35	....	.33	....	.30	....	.30	....	....	....	....
Homestake	S.Dak	100	65.00	....	65 00	....	....	....	....	....	65.0	....	72.00	....	100
Horn Silver	Utah	25	1.05	....	1.15	....	1.00	....	1.10	....	1.10	....	....	....	....
Iron Sliver	Colo	20	.55	....	.53	....	.50	....	.50	....	.50	....	....	....	100
Isabella	"	1	1.39	....	1 35	....	1.25	....	1.3	....	1.25	....	1.152	1.41	1,300
Jack Pot	"	1	.60	....	.56	....	.56	....	.55	....	.55	....	....	....	1,600
King & Pemb	Ont	10	.60	....	.56	....	.50	....	....	....	.45	....	....	....	....
Lacrosse	Colo	10	.16	....	.16	....	.15	....	16	....	.16	....	....	....	....
Leadville Con	"	10	.07	....	.07	....	.07	....	.07	....	.07	....	....	....	....
Little Chief	"	50	.17	....	.17	....	.7	....	....	....	.17	....	....	....	....
Mexican	Nev	3	.44	....	.43	....	.40	....	.37	....	.30	....	....	....	....
Mollie Gibson	Colo	5	.23	....	.25	....	.22	....	.22	....	.23	....	.19⅜	.18	1,000
Morenci Cop. pf	"	1	1.812	....	1.817	....	....	....	1.80	....	....	....	1.815	1.81	1,250
Mouiton	Mont.	25	.3.	....	.30	....	.25	....	25	....	.35	....	....	....	100
Mt. Rose	Colo	1	.38	....	.40	....	.40	....	.38	....	.41	....	....	....	400
Occidental	Nev	3	.12	....	.12	....	.10	....	.10	....	.10	....	....	....	....
Ontario	Utah	10	9.00	....	8 25	....	7.75	....	7.50	....	9.00	....	....	....	250
Ophir	Nev	3	.90	....	.90	....	.90	....	.90	....	.75	....	....	....	....
Pinnacle	Colo	1	.27	....	.24	....	.25	....	.24	....	.24	....	....	....	....
Pharmacist	"	1	.06	....	.06⅜	....	06½	....	.06	....	....	....	....	....	1,500
Phoenix	Aris	1	.10	....	.11	....	12	....	.1	....	....	....	....	....	1,100
Plymouth Con	Cal	10	.10	....	.08	....	.08	....	.20	....	.08	....	....	....	....
Portland	Colo	1	2.45	....	2.3	....	2.40	....	2.25	....	2 25	....	2.356	2.355	1,600
Potosi	Nev	3	.22	....	.2	....	.2	....	.16	....	.19	.28	....	....	500
Quicksilver	Cal	100	2 00	....	2.00	....	1.50	....	1 80	....	2.00	....	....	....	100
do. pref	"	100	7 50	....	7 50	....	7.10	....	7.50	....	7.50	....	....	....	....
Savage	Nev	2½	.10	....	.10	....	.0	....	....	....	....	....	....	....	....
Sierra Nevada	"	3	.50	....	.63	....	.50	....	.48	....	.40	....	....	....	300
Small Hopes	Colo	20	1.0	....	1.00	....	.95	....	.95	....	1 00	....	....	....	....
Specimen	"	1	.10	....	.10	....	.09	....	.0	....	.08	....	....	....	....
Standard Con	Cal	1	2.70	....	2.70	....	2.55	....	2.70	....	2 50	....	....	....	....
Syndicate	"	....	....	....	....	....	....	....	....	....	.03	....	....	....	1,000
Tenn Copper	Tenn	25	14 0	12 5	13.00	....	13.00	....	11 00	10 5	12.00	10.00	1 00	10.00	....
Tornado	Colo	1	.42	....	.49	.48	....	....	44	....	48	....	....	....	2,500
Union	"	1	.35	....	.35	.33	.35	....	.34	....	.32	.28	.36	.34	....
Union Con	Nev	2½	.31	....	.28	....	.30	....	.28	....	.42	....	....	....	....
Utah Con	"	5	.07	....	....	....	.06	....	.06	....	.06	....	....	....	500
Work	Colo	1	.31	....	.28	....	.26	....	.2	....	25	....	.28	26½	1,000
Ye'low Jacket	Nev	3	.15	....	.14	....	.12	....	.10	....	.16	....	....	....	500

COAL AND INDUSTRIAL STOCKS.

Am. Sm. & Ref.	.....	$100	39⅜	35⅜	36⅜	35⅜	36	34⅜	36⅜	33⅜	35⅜	34	34	....	11, 52
" " pf	.....	100	89	88	88	87	87⅜	85	88	87	89⅜	87⅜	89⅜	....	7,293
Am.S &W Co n	.....	100	44⅛	40	4.⅜	38⅜	39	36⅜	40	37⅜	39⅜	34⅛	39⅜	....	95,830
" " pf rn	.....	100	94⅜	92⅜	9.⅜	89	90	85⅜	9 ⅛	89	90⅜	88⅛	88⅜	....	11,000
Central of N. J.	N. J.	100	118⅜	118⅜	117⅜	114⅜	117⅛	115	117	116⅛	116	114	....	....	17,210
Col. C. & I. Dev	Colo	100	....	....	....	....	....	....	1.⅛	....	.⅜	....	....	....	2 0
Col. Fuel & L	Colo	100	52⅝	51	5)	49	47	42	4 ⅜	44⅛	45⅝	41	42	..	33,015
Col. & H.C.&I.	Ohio	10	....	....	....	....	7⅜	16⅛	16⅛	16	14⅜	....	14⅜	....	1,900
Del. & Hud	N. Y.	100	118⅜	117⅜	117⅜	116	116	114	117⅜	115⅜	117⅜	1 4⅜	115	....	15,76
Federal Steel	....	100	59⅛	56	57⅛	55⅜	45	4.⅜	57⅜	4.⅜	58⅛	53⅜	53	....	19 97
" " pf	....	100	79⅜	77⅜	78¼	76⅜	73⅛	76	79⅛	78	78⅜	76	75⅜	....	87,941
National Lead	N. Y	100	28	26⅜	26⅛	26⅜	26⅜	26	27	26⅜	26	2⅜	25⅜	....	4,655
" " pf	Md.	100	....	....	1 6⅜	1.5	....	....	....	....	105	....	....	....	330
National Sa't	....	100	47	44⅛	46	44	47	45	47	45	47	45	47	44	....
" " pf	....	100	79⅛	78	80	78	79	78	79	78	79	78	79	78	....
N. Y., Ont. & W.	N. Y.	100	24⅛	24⅛	24⅜	24⅛	24⅛	23⅜	24⅛	23⅝	24	2.⅜	23⅛	....	26,440
Reading, 1st pf.	Pa	10	57⅛	55	56⅛	5 .⅜	55⅜	54⅜	56⅛	55	5.⅛	54	55	....	4,740
" " 2d pf.	"	10	29⅛	29¼	29¼	29	29	28	29¼	28⅛	28⅝	28	28⅜	....	14,845
Republic I & S.	....	10	2 .⅜	20⅜	20⅜	20	20	18	21	19⅛	20⅜	19	19⅛	....	19,530
" " pf	....	10	69⅜	68⅜	68	67	68⅛	64	67⅜	66	68	6.⅜	67	....	7, 88
*Stan.Oil of N J.	N. J.	10	470	468	468	466	466	464⅜	466	463	466	464	466	461	....
Tenn.C..I.&R.R.	Ala	10	10.⅜	1.6⅜	10.6	04	08⅜	85	91	85⅜	8.⅜	78	81	....	54,86

* Ex-dividend.

PHILADELPHIA, PA.

NAME OF COMPANY.	L'cation.	Par Val.	Dec. 7. H.	Dec. 7. L.	Dec 8 H.	Dec 8 L.	Dec.9 H.	Dec.9 L.	Dec. 11. H.	Dec. 11. L.	Dec. 12 H.	Dec. 12 L.	Dec. 13. H.	Dec. 13. L.	Sales
Am. Alkali	.....	.....	3 00	....	....	....	3.00	1.50	3.00	....	3.00	3.88	3.00	2 88	1,238
" " pf.	.....	.....	....	....	....	....	....	....	....	....	....	....	1.25	....	800
Bethlehem Irn	Pa.	.....	....	....	....	....	79 00	....	9.00	....	59.00	....	....	....	44
Bethlehem St'l	"	$50	....	....	....	....	18.0	17.50	17.50	17 25	17.0	17.00	17.50	....	976
Cambria Iron	"	50	44 13	44. 0	44.13	....	44.0	....	....	....	....	....	....	....	200
Cambria Steel	I.T.	50	21.2	21.00	21.13	20 88	21.00	....	20 50	20.00	20 75	20.50	21.00	20.25	7,757
Choctaw pref.	Pa.	50	....	....	44 00	....	43 .0	....	43.50	42 50	42.75	....	42.5	....	535
Lehigh Val	"	50	26 00	....	26.00	25 88	25 75	....	25.50	25.00	25.2	24.75	25.00	....	3,734
Penna. R. R.	"	50	67.38	67 13	67 1	66.88	67. 0	66 0	66 0	65.50	66.0	65.88	67.13	65.88	7,302
Susq I & S.	"	....	4 88	4.75	5.00	4.7.	5 00	4 .5	4.75	4.50	4 88	4.78	5.00	4.75	2,430
United Gas I	"	50	159⅝	..	160	157	157½	1.6⅜	159⅜	158⅜	157⅜	155⅜	1.6⅛	.55	4,122
Welsb. of Can	Can.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Welsb. Comi	"	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Welsb Light.	"	100	47.0	46 50	48.0	46 5	46.50	45 38	44.00	....	44 .0	43.75	45.00	44 40	795

Total shares sold, 29,5 0.

SALT LAKE CITY, UTAH.* Dec. 9.

Stocks.†	No of shares	Par val.	Bid.	Asked.	Stocks.†	No of shares.	Par val.	Bid.	Asked
Ajax	300,000	$10	$.60	$1.25	Homestake	400,000	$1	$0.10	$0 12
Alice	400,000	25	.37	.63	Horn Silver	400,000	25	....	....
Anchor	150,000	10	....	....	Joe Bowers	400,000	1	.13⅜	.13⅜
Buckeye	500,000	1	.02	.03	Little Pittsburg	400,000	5	.06⅜	.06⅜
Bullion-Beck & Ch.	100,000	10	3.50	4.00	Lower Mammoth	150,000	1	.36⅜	.40
Centennial Eureka	50,000	50	....	....	Mammoth	400,000	5	2.79⅜	2.83⅛
Chloride Point	800,000	1	.15	.20	Mercur	200,000	25	6 65	6.78
Daisy	500,000	3	.11⅜	.13⅛	Northern Light	400,000	5	15⅜	16⅜
Dalton	500,000	5	....	....	Omaha	800,000	2	.05	....
Dalton & Lark	2,500,000	1	.05	.05⅜	Ontario	150,000	100	8.50	9 5⅞
Daly	150,000	20	1.55	1.78	Richmond-Ana	500,000	1	.20	....
Daly West	150,000	20	12 55	12 62	Sacramento	1,000,000	5	80⅜	....
Dexter	300,000	5	2.16	2.30	Silver King	150,000	20	51 75	....
Eagle	150,000	1	....	....	Star Consolidat'd	500,000	1	.22⅜	.27
Eagle & Blue Bell	250,000	1	1 46	1.52	Sunbeam	250,000	1	.59⅜	60⅛
Emerald	300,000	1	....	....	Sunshine	250,000	10	20	.30
Four Aces	250,000	1	.05	....	Swansea	100,000	5	3 75	.46
Galena	100,000	10	.10	.40	South Swansea	150,000	1	1.05	....
Geyser-Marion	300,000	5	.19	.25	Utah	100,000	1	....	.30
Grand Central	250,000	1	6 07	6 12	Valco	200,000	10	40	....

*From Our Special Correspondent. † Utah companies. § Mines in Vanderbilt, Cal. Mines in Tuscarora, Nev.

BOSTON, MASS.†

NAME OF COMPANY.	Par val.	No. of shares.	Dec. 7. H.	Dec. 7. L.	Dec 8. H.	Dec 8. L.	Dec. 9. H.	Dec. 9. L.	Dec. 11. H.	Dec. 11. L.	Dec. 12 H.	Dec. 12 L.	Dec. 13. H.	Dec. 13. L.	Sales
Aetna, cons. g.	$25	100,000	4.50	....	....	....	....	....	....	....	....	....	....	....	300
Adven'u'e,Cons	25	100 000	....	....	6.00	5 75	....	....	....	....	....	....	....	....	890
Alloues	25	80,000	8.00	....	3.00	....	3.00	....	....	....	6.00	5.75	6.00	....	400
Am. Z. L. & S	25	1,200,000	....	....	....	....	....	....	....	....	....	....	25.00	....	150
Anaconda	25	1,2.0, 00	30.00	29 00	43.00	....	....	....	....	....	40.50	....	39 50	39 25	39..0	38.75	155
Arcadian, c	25	150,000	30.00	29.00	30.00	28.00	28.00	26.00	26.00	26 0	23.75	26.50	22 00	25 00	22.50	4,671
Arnold, c	25	60,000	7.00	....	7 00	6.5	6.25	6 00	6 00	....	....	....	....	5.5.	....	1,665
Ashbed	25	4!0,0!0	....	....	....	....	....	....	....	....	....	....	....	....	....
Atlantic, c	25	40,000	6.5	26.00	....	....	....	....	....	....	22.00	....	21.00	....	23.00	....	655
Baltic, c	25	100,000	22.22	44.00	2 50	20.50	20.50	20 00	....	....	....	....	20.00	....	....	....	1,343
Bingham, c&g	10	1.0,000	13.0	12 25	13.0	12.25	2 50	2 25	12.00	11.50	14.00	11.00	12 0	11.00	8,553
Bonanza, g	10	900,000	1.25	....	1.18	....	1.00	....	1.00	....	....	....	1.25	....	2,895
Boston, g	10	100,000	....	....	....	....	....	....	6.00	....	....	....	....	....	75
Boston&C C	2	200,000	....	....	....	....	....	....	....	....	....	....	....	....	....
Bos.&Mon,Tr R	25	150,000	8.5	303	304	296⅜	295	290	290	285	290	275	285	270	1,999
Breece	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
British Col	5	200,000	....	....	16.25	....	....	....	....	....	10.00	....	10.50	10 00	200
Butte & Bost., c	10	200,000	69.50	....	68.0.	65.00	67.00	....	60 00	60.0.	2.00	48.50	53 75	49.00	5,269
Cal. & Hecla, c	25	100,000	.40	735	740	735	735	....	720	720	745	720	730	....	218
Centennial, c	25	9!,000	2.00	....	.20	63	20 00	....	20.25	20.00	2.00	18.00	19 00	8.00	20 00	9 00	5,518
Central Oil	25	59,720	20.7	45.25	20.38	20.0.	20.25	20 0	20 00	19 00	19.0	19.25	20 00	19 00	4,825
Cochin g	10	150,000	14.00	....	14.00	13.50	.3 8	12 75	13 00	12.0.	12.25	12.0.	13.50	13.00	5,680
Cont.ZLMg&Sm	10	110,000	....	....	....	....	4 63	4 50	....	....	....	....	2 50	....	100
Copper Range	10	100,000	35.00	34 50	34.50	33.50	33.00	....	....	....	31.50	....	32.00	....	1,500
Crescent, g	1	300,000	....	2	....	....	....	....	....	....	....	....	....	....	200
Dominion Coal	100	150,000	50 00	49 00	48.25	47.50	47.50	46 50	47.00	45.00	47 50	45.50	47 00	46.00	8,469
do. pref.	100	2),000	....	....	....	....	....	....	....	....	....	....	118	....	175
Elm River Mg	12	300,000	6.00	5.5.	6 00	....	....	....	....	....	5 50	5.00	5.25	....	5.75	5.00	1,875
Federal Steel	100	464,843	60.75	59.6	19 13	56.13	57.00	55 50	6 00	54.00	57.25	56.00	57 00	54.25	6,425
do. pref	(0	532,610	8.50	79.5.	.9 .0	78.35	77.00	.6 75	78 .0	76 25	79.00	78.00	79.75	76.75	1,801
Franklin, c	25	100,000	15 50	....	16.00	.5.50	....	....	15.75	15.0.	15 00	....	15.00	....	1,170
Humboldt	25	40,000	....	....	....	....	....	....	....	....	....	....	....	....	....
I. Royal Con. c	25	100,000	29.00	28.00	28 25	27 50	28 00	27.00	26 50	23.00	4.0	23.00	26.25	23 00	7,930
Mass. Con	25	100 00	10.0	....	9 75	....	....	....	9.00	....	9.75	9.00	9 00	....	810
Mayflower	25	1!0,0 0	3.00	....	....	....	....	....	....	....	3.00	....	....	....	600
Melones	10	167,577	....	....	1.75	....	1.50	....	....	....	1.50	....	....	....	2,550
Merced, g	15	100,00	....	....	9.50	....	....	....	9 00	....	8.75	....	8.50	....	250
Michigan	25	10!,0 0	8 75	....	8.50	....	....	....	8 5.	7.00	8.50	6.00	....	....	815
Mohawk, c	25	100,000	17 00	....	17.2	16 86	16.50	15.50	6.00	15 00	16.00	1.00	16.00	15.50	1,500
Montana C &C	25	200,000	9.00	8.75	8.75	8.50	....	....	....	....	7.50	7.00	8.00	7.25	1,315
New Idria	5	100,000	....	....	....	....	....	....	....	....	....	....	....	....	....
N.A Gold Dre'p	10	100,000	12.00	....	....	....	1.00	10.50	11 00	9.25	....	....	9.00	....	815
Old Colony, c	25	100,000	6 00	....	5.25	5.13	....	....	4 00	3.50	4 00	....	5 00	4.50	1,131
Old Dominion, c	25	150,000	26.50	5 00	25 50	25.0.	25 50	24.00	24 00	22.00	22 00	20 00	23.25	1 00	16,511
Osceola, c	25	93,000	75.00	25.00	78 5.	70.25	75.00	69 25	66 5	64 00	68 00	64.50	69.00	65.00	4,301
Parrot, s c	10	229,850	40.00	78.00	39.50	37.75	38.00	35 00	4.00	31.50	35 50	33.62	37.00	35.00	7,765
Pioneer, q	10	100,000	2.88	39.50	....	....	....	....	2.40	....	2.50	....	2.25	2.00	775
Quincy, c	25	100,000	150	2 75	1.51	149⅜	145	....	145	142	150	125	140	135	996
Rhode Island	25	100,000	5 50	....	5 50	....	5.50	....	5 00	....	5.00	....	5 00	....	630
Santa Fe, g. & c	10	250,000	6.5.	....	6.00	....	6.25	5 50	6.25	6 00	6 00	5.00	6 00	5.00	5,575
San. Yaanel, g	5	1 30,000	9 00	6.00	9.25	7.75	8 00	7.75	3 00	....	8 00	7.00	7 88	....	2,978
Tamarack, c	25	60,000	210	7 80	....	....	03	200	200	194	199	190	200	185	1,188
Tecumseh	....	....	....	....	....	....	....	....	4 50	....	....	....	3.50	....	25
Tri Mountain	25	100,000	8.50	8.25	....	....	8.38	8.00	8 50	8.10	7 25	....	....	....	935
Union C L	....	....	....	....	3.00	....	....	....	5.00	3.25	3 00	....	....	....	322
United States	25	250,000	31.13	30 88	33.88	30 63	30 50	30 0.	31.50	30.0.	31.50	30.00	3..50	29.50	20,955
U. S. Oil	25	100,000	39.25	37 00	39.00	36 75	37.00	31 00	36.0.	33 50	34.75	34.00	36.00	33.75	23,091
Utah Cons,g &c	5	3 0,00	4 50	3.75	3.50	3.00	3 25	....	3 00	....	3 00	....	3 00	2 90	7,695
Victor, g	5	2,0,00	3.25	....	....	....	....	....	....	....	....	....	2.00	....	100
Victoria	25	100,000	....	....	4.50	....	4.50	4 25	4.00	....	....	....	....	....	850
Washington	25	40,000	1.38	....	....	....	....	....	1 25	....	....	....	....	....	2.0
Winona, c	10	50,000	7 00	....	....	....	....	....	5.75	....	....	....	5 75	5 00	300
Wolverine, c	25	60,00	39.50	49.00	39.00	38.00	38 00	37.75	37.50	37 00	38.00	36 50	39.00	36.00	2,623
Wyandotte	25	100.0 0	....	....	2.00	....	....	....	3 00	....	....	....	....	....	400

Official quotations Boston Stock Exchange. Total sales, 176,242.

COLORADO SPRINGS, COLO.‡

NAME OF COMPANY.	Par val	Dec. 4 B.	Dec. 4 A.	Dec. 5. B.	Dec. 5. A.	D c 6. B.	D c 6. A.	Dec. 7. B.	Dec. 7. A.	Dec 12. B.	Dec 12. A.	Dec. 13. B.	Dec. 13. A.	Sales.
Alamo	$1	.19⅜	.20¼	12⅜	.13⅜	.13¼	.13⅝	.13⅜	.13⅜	14	14	.14	.14⅜	25,800
Anaconda	1	.45	.46	.44⅜	.46	.44	45	.44	.45	.36	.39⅛	.39	.40	12,300
Arg'ntumJ	1	.19¼	.20¼	.19⅜	20	.19½	.20¼	.19½	.20	....	....	....	....	1,560
Cadillac	1	.02⅜	04	.02⅜	.02⅜	.02⅜	.02⅜	.02⅜	.02⅜	....	....	....	....	9,000
C. C. Con	1	.17	.17⅜	.17	.17⅜	.6⅜	.17	.16	.16¼	15	.15½	.15	.15¼	13,000
Dante	1	.18⅜	.19⅛	.19	.19⅛	.87⅛	.18⅜	.18⅜	.19⅛	....	....	....	....	48,000
ElktonCon	1	1.16	1 16⅛	1.16⅛	1.16½	1.17	1 18	1 17	1.20	1.18	1.15⅜	1.16	1.16¼	12,100
El Paso G	1	.31	.3.	....	....	....	....	30	23	.31	.24	.28	....	....
Favorite	1	.06⅛	.06⅜	06	06⅜	.06	.6⅜	.05⅜	.05⅞	....	....	....	....	23,300
Findley	1	....	15	.14⅛	.15	14⅜	.14⅜	14⅜	....	.12⅜	.13	.12⅜	.13¼	7,000
Golden Fl	1	.28	.31	.30	....	.31	....	....	....	30	.35	.30	.35	500
Gold Hill	1	03	.13⅜

STOCK QUOTATIONS.

DENVER, COLO.‡

Name of Company.	Par val.	Dec. 2 B.	Dec. 2 A.	Dec. 4 B.	Dec. 4 A.	Dec. 5. B.	Dec. 5. A.	Dec. 6. B	Dec. 6. A	Dec. 7. B.	Dec. 7. A.	Dec 8 B.	Dec 8 A.	Sales.
Mines:														
Anac'da G..	$5	.....	47	.....	.46	.....	.46	.....	45¾	.44¾	.....	.....	.44	2,100
Arg. J....	1	.....	.....	.....	.....	.....	.....	.19¾	20¾	.....	.....	.....	.....	.....
Bankers	1	.13¾	.14¾	.....	.....	.....	.....	14	.....	.13¾	.....	.....	.....	.....
CrippleC.C.	1	.....	.....	.....	.....	.....	.....	.16	17	.15¾	.....	.....	.....	.....
Delta S	1	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Elkton Con	1	1.17¾	1.18¾	1 16	.....	1.16¾	.....	.....	.....	1.17	.....	.....	.....	.....
Findley....	1	.....	.....	.....	.....	.....	.....	.14¾	.....	.....	.19	.15¾	.....	.....
Garf. Con..	1	.....	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Coin..	1	2.25	.....	.....	.....	2.20	.....	.....	.....	.....	.....	2.20	.....	.....
Goldstone..	1	.....	.....	.....	.....	.....	.02¾	.02¾	.02¾	.02¾	.03¾	.02¾	.....	.....
Independ'nce	1	.....	.....	.49	.51	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ironclad....	1	.....	.....	.....	.....	.....	.....	.....	.....	.01¾	.....	.05	.....	.....
Isabella....	1	1.41	1.43	1.43¾	1 48¾	1.43	1.43¾	.....	.....	1.39¾	.....	.....	1.41¾	11,100
Jack Pot...	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jefferson..	1	.....	.....	.....	.09¾	.....	.....	.....	.....	.....	.....	.....	.....	.....
Keystone ..	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.15	.....	.....	.....
LosAngeles	1	.....	.....	.....	.....	.....	.....	.22	.....	.....	.....	.....	.....	.....
Mollie Gib.	5	.22	.23	.23¾	.....	.23¾	.....	.....	.....	.21¾	.....	.22¾	.....	.....
NewZealnd	1	.....	.50	.....	.46	.53	.....	.....	.55	.43¾	.52	.43¾	.50	.....
Ophir	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pharmacist	5	.....	.....	.....	.15¾	.....	.....	.....	.....	.....	.....	.14¾	.....	.....
Portland..	1	2 42	.....	2.42	2.43¾	.....	.....	.....	.....	.....	.....	.....	.....	1,000
Specimen..	1	.....	.....	.....	.....	.....	.....	.....	.....	.11	.12	.....	.....	.....
Union Gold	1	.36¾	.37	.....	.....	.....	.....	.....	.....	.33¾	.....	.35	36¾	.....
Vindicator.	1	1.50	.....	.....	.....	1.55	..	1.66	.....	1 31	.....	1.75	.....	.....
Work.....	1	.30	.....	.....	.....	.....	.....	.....	.....	.....	.81	.....	.....	.....
Prosp'cts:														
C.C Imp	1	.03¾	.....	.....	.....	004	.006	.....	.....	.....	0 3¼	.....	006	7,000
Illinois	1	.....	.....	.....	01¾	.....	.....	.....	.0¾	.1	01¾	.09	.01¾	.....
Old Gold....	1	.01¾	.02	.01¾	.02	.01¾	.....	.....	.....	.....	.....	01¾	.....	29,000
Puritan	1	.02¾	.03	.02¾	03	.....	.....	.02¾	.....	.02¾	.....	.02¾	.02¾	50,000
Miscell.:														
Acacia.....	1	39¾	.42	.41	41	.....	.....	.39	.....	.36	.39	.....	.38¾	5,000
Alamo.....	1	.12	...	.12¾	.....	.12¾	.....	.12¾	.....	.12¾	.14¾	.....	.13¾	9,000
Aola	1	.06	...	.06¾	.....	.....	.06¼	.06¾	.06¾	.....	.06¾	.05¾	.....	11,500
Battle Mt...	1	.37	...	.38¾	.40	.38	.....	.....	.....	.30	.....	.32¾	.....	.....
Bob Lee	1	.....	...	.....	.....	.....	.....	0-¾	08¾	.03¾	.....	.....	.08¾	1,000
C. C. & M...	1	.....	...	.....	.....	19	.....	.....	.....	.....	.....	.....	.....	.....
De Beers....	1	.09¾	...	.09¾	.....	009¼	.....	01	.....	009¼	.0 3¼	.....	.....	20,000
Des Moines	1	.06	.06¼	.....	.06¾	.....	.06¼	06	.06¾	.....	.06¾	.....	.06¾	.....
Favorite...	1	.....	.....	.06¼	.06¾	.....	.....	.....	.....	.05	.....	.....	.....	1,000
G'ld'n Eagle	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.02¾	2,000
Gr'nite Hill	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Magnet R...	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mobile.....	1	.....	.....	.....	.....	.03¾	.....	.....	.....	.....	.....	.....	.....	.....
Mt. Beauty.	1	11¾	.....	.11¾	.....	.11¾	.....	.11¾	.11¾	.09¾	.....	.10¾	.11	.....
Trachyte....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

‡ Official Quotations Denver Stock Exchange. Total sales, 149,700 shares.

SAN FRANCISCO, CAL.

Name of Company.	Location.	Par. value.	Dec. 7	Dec. 8.	Dec. 9.	Dec. 11	Dec. 12.	Dec. 13.
Alpha Con.....	Nev.	1.00	.04	.03	.03	.03	.03	.03
Alta.....	"	2.00	.06	.06	.05	.05	.04	.04
Andes.....	"	3 00	.12	.13	.12	.11	.11	.10
Belcher.....	"	3 00	.27	.26	.24	.21	.18	.17
Best & Belcher...	"	3 00	.42	.45	.41	.40	.34	.34
Bullion.....	"	1.00	.05	04	.04	.03	.03	.03
Caledonia.....	"	3.00	.61	59	.58	.48	.45	.50
Challenge Con..	"	3.00	20	.18	.18	.16	.14	.12
Chollar.....	"	3.00	19	.18	.16	.14	.12	.14
Confidence.....	"	3.00	.86	.84	.81	.81	.76	.65
Con. California & Virginia..	"	2.50	1.75	1.90	1.75	1 80	1 60	1 60
Cons. Imperial..	"	1.00	.01	.01	.01	.01	.02	.01
Crown Point	"	3.00	.20	.20	.20	.17	.15	.16
Gould & Curry ..	"	3.00	.15	.15	.15	.14	.11	.11
Hale & Norcross ..	"	3.00	39	40	.36	35	.34	.33
Julia Con.....	"	1.00	.02	.02	.01	.02	.04	.02
Justice.....	"	2.00	.08	.07	.07	.05	04	.05
Kentuck Con.....	"	1 00	.01	.01	.01	.01	.01	.01
Mexican.....	"	3.00	.43	.46	.43	.41	.35	.37
Occidental Con..	"	3.00	.16	16	.15	.14	.13	.13
Ophir.....	"	3.00	.95	1.00	.95	94	.82	.83
Overman.....	"	2.00	.16	.10	.14	.13	.11	.11
Potosi.....	"	3.00	.25	28	.24	21	.17	.15
Savage.....	"	3 50	.14	13	.10	.09	.08	.08
Seg. Belcher & M.	"	2.00	.04	.04	.05	.02	.02	.03
Sierra Nevada...	"	5.00	.56	.59	.54	.52	.46	.48
Standard.....	Cal.	10.00	2.75	2.70	2.55	2.80	2 80	2.75
Union Con.....	Nev.	2.50	.34	36	.34	.32	.27	.28
Utah Con.....	"	1.00	.08	.08	.07	.07	.05	.05
Yellow Jacket....	"	3.00	.16	.16	.15	.14	12	.11

Official telegraphic quotations of San Francisco Stock Exchange.

TORONTO, ONT.*

Name of Company.	Par val.	Dec. 5. B.	Dec. 5. A.	Dec. 6. B.	Dec. 6. A.	Dec. 7. B.	Dec. 7. A.	Dec. 8 B.	Dec. 8 A.	Dec. 9. B.	Dec. 9. A.	Dec. 1-. B.	Dec. 1- A	Sale
Ontario:														
Alice A....	$1	.09	.12	.08¾	.12	.....	.....	.08	.12¾	.08	.12	.....	.....	.....
Empress....	1	.02	.03¾	03	.04	.03¾	.03¾	.03¾	.03¾	.03	.03¾	.....	.....	4,500
Golden Star	1	.30¾	33	.31	.32	.31	.32¾	.31	.33¾	.31¾	.33	.32¾	.33	.....
Ham Reef..	1	.14¾	.20	.16	.20	.15	.20	.14	.19	.20	.18	.14	.18	.....
British Col.:														
Athabaska..	1	.33¾	.37	.33	.37	.33	.37	.33	.37	.33	.37	.33	.37	
Big Tree ..	1	.12¾	.13	12	.13¾	.11¾	.13	.11¾	.13	.12¾	.13	11	.13	2,500
Br'd'n&G.C.	1	.27	.30	.30¾	.32	.26½	.30	.28	.30	.27	.29	.27	.30	1,000
Crow's N. C.	$5	35.00	39.50	34 50	38 50	33 00	40.00	32 0	38.00	35.00	38.50	34.50	37.50	.....
Dardanelles	1	.17¾	.23¾	10¾	.12	.10¾	.13	.10¾	.12	.10	.12	.10¾	.....	.....
DeerT'lNo.2	1	.16¾	.19¾	.16	.18	.15¾	.18	.15	.18	.15	.17	.15	.16¾	.....
Even'g Star	1	.06¾	09	06¾	.09	.08¾	09	.08	09	.07¾	.10	.07	.09¾	1,000
Fairview C.	0.25	.04¾	.06¾	.04¾	.06	.05	.0 3¼	.04¾	.05¾	.04¾	.06	.04	.06	29,500
Minnehaha.	1	.14	.16¾	.13¾	.15¾	.14¾	16	.14	.16¾	.14¾	.16¾	.14¾	.16¾	.....
Morrison....	1	.08¾	.12	.08¾	.12	.07¾	.10¼	.08¾	.16	.07¾	.08¾	.08	.10	800
Mont &Lon..	0.24	.40¾	.42	.39	42	.....	.....	.39¾	43	.38¾	42	.....	.....	.....
Noble Five.	1	.15	.19	.08	.19	.13	.18	.19	.20	.20	.....	.14	.18	.....
No Belle...	1	.01¾	.03¾	.01¾	.02¾	.01¾	.02¾	.01¾	.02	.01¾	.02	.01¾	.02	8,800
Novelty....	0.10	.01¾	01	.01¾	.03	.0 9¾	03	.01¾	03	.01¾	.03	.02	.02¾	1,000
Rambler....	1	.57¾	.63	.58	.61	.58	.60	.58	.63	.57	.60	.57	.58	5,000
Ratnmullen	1	.07	.08	.07	.08	07	.08	.07	.08	.07	.08	.07	.08¼	5,000
Republic...	1	1.13	1.16	1 14	1.18	1 13	1.18	1.12	1.17	1.13	1 16	1.13	1.15¾	.....
St Paul	1	.01	02¾	.01	.02	01	.02	.01	.03	.....	.....	.....	.....	500
Van Anda ..	1	.06	07	.06	.07	.06	.07	05	.06¾	.05	.06	.05	.06	2,000
Victory Tri.	1	.03	.05¾	.03¾	.04¾	.03¾	.05¾	.03¾	.05	.04	05	.0 3¾	.0 5¾	12,000
Virtue	1	4 3¾	.42	.39	.42	.....	.....	.....	.....	.36	.38	.38¾	.42	.....
War Eagle..	1	2.78	2 82	2.75	3.81	2.73	2.79	2.75	2.79	2.77	2.80	2.69	2.75	300
Waterloo....	0.10	.12¾	.13¾	.13	.14	.12¾	14	.12¾	14	.13¾	.13¾	.12¾	.13¾	15,100
White Bear.	1	.03¾	.04¾	03¾	04	.03¾	.04	.03¾	.04	.03¾	.04¾	03¾	.03¾	6,000
Winnipeg..	1	30	.33	.39	.31	.29	.32	.30	.31¾	.28	.32	.30	.32	1,200
Develop Co.														
B.C.G.Flds	1	.03	.04	.02¾	.04¾	.03¾	.04¾	03¾	04¾	.03	.04	03¾	04	18,500
Can. G.F.S	0 10	.04¾	.08	.03¾	.08¾	.07	08	.03¾	.08	.03¾	.07¾	.03¾	08	2,000
Gold Hills .	1	.04¾	.06	.04¾	.05¾	.04¾	.05¾	.04¾	.06	.04¾	.05¾	.05	.06¾	.....

*Official quotations of the Standard and Toronto Mining and Industrial Exchanges. Total shares sold, 116,900.

MEXICO.

Dec. 1.

Name of Company.	No. of shares.	Last div'd.	Prices. Op'g.	Prices. Cl'g.
Chihuahua:				
Gloria.....	1,500	.....	$50	$50
Durango:				
Barradon y Cab....	2,400	.....	40	40
Candelaria de Pan.	1,200	.....	20	20
Capuzays.....	2,400	.....	30	30
Penoles.....	2,500	30.00	2,000	3,000
Restauradora.....	10,000	.....	20	20
Rosario y Anexas.	4,800	.....	10	10
Guanajuato:				
Angustias.....	2,400	5.00	250	225
Cinco Senores y An	2,000	15.00	350	170
El Oro.....	500		30	30
do. pref.....	2,000		30	30
Guadalupe Hacie'a	10,000	3.00	270	240
Trinidad, aviador.	2,000	.....	30	35
do. aviada.....	400	.....	30	25
Zona Minera de Pas	2,400	.....	25	20
Hidalgo:				
Amistad y Concord.	9,600	1.47	28	29
Arevalo.....	720		200	200
Bartolome de Med.	2,000	8.00	65	70
Carmen.....	1,100	7.75	350	300
Luz de Maravillas..	900	.....	120	100
Pabellon.....	800	27.89	30	20
Hidalgo:				
Real del Monte..	2,554	10.00	540	550
San Francisco He	6,000	3.00	220	225
San Rafael y An.	1,200	12.00	1,000	1,020
do. aviado	1,200	6.00	400	410
do. del Oro.....	3,000	5.00	20	20
Soledad.....	960	5.00	370	370
Sorpresa.....	960	7.50	340	350
Union Hacienda.	2,000	5.00	350	340
Mexico:				
Coronas.....	500	.....	75	75
Esperanza y An..	3,000	10.00	1,000	1 580
Michoacan:				
Luz de Borda ava	4,000	.....	30	22
Pueblo:				
Tlauzingo.....	2,400	.....	27	28
S. Luis Potosi:				
Concep. y An.	2,400	.....	230	240
Sta.MariadelaPaz	2,400	10.00	720	840
Zacatecas:				
Asturiana y An..	2,500	10.00	305	270
Cabezon	2,400	.....	15	15
C'delar. de Pinos.	2,500	.....	60	80
Palma de Somb..	2,400	.....	100	80

PARIS.

Nov. 23.

Name of Company.	Country.	Product.	Capital Stock.	Par value.	Latest divs.	Prices Op'ning	Prices Closing
			Francs.	Fr.	Fr.	Fr.	Fr.
Aciéries de Creusot....	France.....	Steel mfrs..	27,000,000	2,000	75.00	1,9?0.00	1,9.5.00
" " Firminy....	"	" " ..	3,000,000	500	125.00	3,640.00	3,6?1.00
" " Fives-Lille..	"	" " ..	12,000,000	500	35.00	540.0	540.00
" " Huta-Bank..	Russia.....	Iron & steel	.....	500	.....	4,720.00	4,775.00
" " la Marine...	France.....	Steel mfrs..	20,000,000	500	?0.00	1,765.00	1,770.00
Anzin.....	"	Coal.....	.....	.....	220.00	7,5 0.00	7,559.00
Bolco.....	Lower Cal..	Copper.....	.....	500	1.07	2,85?.00	2,869.00
Briansk.....	Russia	Coal & iron	.....	500	.....	1,248.75	1,2.0 75
Champ d'Or.....	S. Africa....	Gold.....	3,375,000	25	3.75	4?.00	40.75
Courrieres.....	France.....	Coal.....	600,000	300	70.00	3,125.00	3, 00.00
Dombrowa	Russia	Coal.....	.....	500	12.50	1,1?0 00	1,150.00
Donets.....	"	Steel.....	.....	.....	.....	1,225 00	1,200.00
Dynamite Centrale....	France.....	Explosives..	.....	500	12.40	470.00	475.00
Escombrera-Bleyberg...	Spain.....	Lead.....	.....	500	55.00	1, 2?0.00	1,285.00
Fraser River.....	Brit. Col'mb	Gold.....	250,000	25	.....	6,?0	7.00
Huanchaca	Bolivia.....	Silver.....	40,000,000	125	5.00	5?.00	54.00
Laurium.....	Greece.....	Zinc & lead.	16,800,000	500	30.00	6?1.00	620.00
Malfidano.....	Italy.....	Zinc.....	12,500,000	500	50.00	1,3?5.0	1,358.00
Metaux, Cie. Fran. de...	France.....	Metal d'iers.	25,000,000	500	30.00	5?.00	55.00
Mokta-el-Hadid.....	Algeria.....	Iron.....	15,312,500	500	40.00	1,23 .00	1,230.00
Napthe Baku.....	Russia.....	Petroleum..	.....	.....	.....	8 7.00	806.00
Napthe, Le.....	"	" ..	.....	.....	.....	1,3 0.00	1,300.00
Napthe Nobel.....	"	" ..	.....	.....	.....	471.50	481.?0
" " parts.....	"	" ..	.....	.....	.....	13,57?.00	13,662.50
Nickel.....	N.Caled'nia	Nickel.....	10.000.000	250	10.00	366.50	367 00
Penarroya.....	Spain.....	Coal, etc....	.....	500	65.00	2,725.00	2,?50.00
Rebecca.....	Colo'do,U.S.	Gold.....	5,000,000	25	.....	4.75	4.50
Salines de l'Est.....	France.....	Salt.....	.....	500	11.50	283.?0	300.00
Salines du Midi.....	France.....	" etc.....	.....	500	25.00	92?.00	950 00
Vielle Montagne.....	Belgium	Zinc	9.000.000	50	30.00	77?.00	780.00

LONDON.

Dec. 1.

Name of Company.	Country.	Author ised capital.	Par value.	Last dividend. Amt.	Last dividend. Date.	Quotations. Buyers	Quotations. Sellers
				£ s. d.	s.d.	£ s. d.	£ s. d.
Alaska Goldfields.....	Alaska.....	£300,000	1 0 0	2 1	Mar., 1899	17 6	1 0 0
Alaska-Mexican, g	"	200,000	1 0 0	0 4	Nov., 1899	17 6	1 2 6
Alaska-Treadwell, g.....	"	1,000,000	5 0 0	1 6	Nov., "	5 0 0	5 5 0
Anaconda, c., s.....	Montana.....	6,000,000	5 0 0	8 2	Nov., 1899	9 2 6	9 7 6
Chiapas, g., s., c.....	Mexico.....	300,500	1 0 0	.....	.....	6	7 0
Con. Gold Fields	"	900,000	1 0 0	.....	.....	13 6	1 0 0
De Lamar, g., s.....	Idaho.....	400,000	1 0 0	6	May, 1899	4 6	5 6
Elkhorn Priority (New), s	Colorado.....	87,500	1 0 0	1 0	June, 1898	1 3	3 9
Golden Gate, g.....	California.....	80,000	1 0 0	.....	.....	1 0	3 0
Grand Central, g., s.....	Mexico.....	300,000	1 0 0	2 0	Aug., 1899	1 7 6	1 10 0
Hall Mines, c., s.....	British Col....	250,000	1 0 0	1 0	May, 1898	6	7 6
Le Roi, g.....	"	1,000,000	5 0 0	5 0	Nov., 1899	5 13 9	5 16 3
*Lillie, g.....	Colorado....	250,000	1 0 0	2½	Dec., 1899	15	1 0 0
Montana, g., s.....	Montana.....	660,000	1 0 0	6	Apr., 1899	4 6	5 0
Mountain Copper.	California.....	1,250,000	5 0 0	9 0	Sept., 1899	7 2 6	7 7 6
Newfoundland, c.....	Newfoundland.	250,000	1 0 0	.....	.....	7 6	12 6
Palmarejo & Mexican, g., s	Mexico.....	80,000	1 0 0	.....	.....	2 0	3 0
Stratton's Independence..	Colorado.....	1,100,000	1 0 0	2 0	Dec., 1899	2 18	3 3
Copiapo, c.....	Chile.....	200,000	2 0 0	3 0	Dec., 1899	3 17 6	4 2 6
Frontino & Bolivia, g . .	Colombia.....	140,000	1 0 0	1 6	Oct., 1899	2 0 0	2 2 6
St. John del Rey, g.....	Brasil.....	600,000	1 0 0	1 3	June, 1899	1 9 6	1 10 6
UtahCon.,g(High'ndBoy)	Utah.....	300,000	1 0 0	rts.	Mar., 1898	7 7 6	7 12 6
Velvet, g.....	BritishCol'mbia	100,000	1 0 0	.....	.....	1 7 6	1 12 6
Ymir, g.....	"	200,000	1 0 0	1 0	Nov., 1899	1 8 9	1 11 3
British Am. Corp.	"	1,500,000	1 0 0	rts.	Dec., 1899	1 1 0	1 0 0
Linares, l.....	Spain	45,000	5 0 0	12 6	Oct., 1899	8 10 0	9 10 0
Mason & Barry, c., sul....	Portugal.....	420,000	2 0 0	5 0	May, 1899	4 2 6	4 7 6
Rio Tinto, c	Spain.....	1,625,000	5 0 0	1 15	Nov., 1899	46 7 6	46 12 6
" " pref.....	"	1,625,000	5 0 0	2 6	" 1899	5 17 6	6 2 6
Tharsis, c.....	"	1,250,000	2 0 0	11 0	May, 1898	8 17 6	9 2 6
Assoc. Gold Mines.....	W. Australia..	500,000	1 0 0	4 0	Oct., 1899	9 10 0	9 15 0
Broken Hill Prop., s....	N.S.Wales....	384,000	8	0 1 0	Oct., 1899	2 5 0	2 7 6
Great Boulder Prop.	W. Australia..	1,750,000	2	0 6	Dec., 1899	1 18 0	1 19 0
Hannan's Brownhill, g...	"	110,000	1 0	0 7 6	Jan., 1900	12 3 9	12 6 3
Ivanhoe Gold Corp.....	"	1,000,000	5 0	0 5 0	Oct., 1899	16 2 6	16 7 6
Kalgurlie, g	"	120,000	1 0	0 rts.	Feb., 1899	9 12 6	9 17
Lake View Consols, g....	"	250,000	1 0	0 £1	Nov., 1899	20 0 0	20 5
Mt. Lyell M. & R., l., c	Tasmania.....	975,000	3 0	0 4 0	Oct., 1899	9 10 12	9 17
Mt. Morgan, g.	Queensland.....	1,000,000	1 0	0 7	Dec., 1899	5 . 3	5 3
Waihi, g.....	New Zealand,..	320,000	1 0	0 2 0	Dec., 1899	10 6 8	10 8 9
Champion Reef, g.....	Colar Fields....	220,000	10	0 4 0	Sept ,1899	5 5 0	5 7 6
Mysore Gold, g.	"	250,000	10	0 4 6	Nov., 1899	5 12 6	5 15 0
*Nundydroog, g.....	"	242,000	1 0	0 2 0	" 1899	3 5 0	3 7 6
Ooregum, g.....	"	145,000	1 0	0 1 6	Dec., 1899	3 10 0	3 12 6
" pref. g.....	"	120,000	1 0	0 1 6	" 1899	4 11 3	4 13 9
British S. Af., chartered.	So. Africa.....	5,000,000	1 0	0 rts	May, 1899	3 18 9	4 1 3
Cape Copper, c.....	"	600,000	1 0	0 6 6	Jan., 1900	5 17 6	6 2 6
" pref	"	150,000	2 0	0 6 6	" 1900	5 7 6	5 12 6
City & Suburban (New), g	Transvaal.....	1,360,000	4 0	0 8 0	Aug , 1899	5 7 6	5 12 6
Con. Deep Level, g.....	"	200,000	1 0	0 x all	June, 1899	1 5 0	1 10 0
Crown Reef, g..	"	120,000	1 0	0 18 0	Nov., 1899	15 0 0	15 10 0
De Beers Con., d.....	Cape Colony....	3,950,000	5 0	0 £1	June, 1899	29 2 6	29 7 6
Ferreira, g	Transvaal	90,000	1 0	0 30 0	Aug., 1899	2 15 0	21 5 0
Geldenhuis Deep, g..	"	350,000	1 0	0 8 0	Aug., 1899	9 0 0	9 10 0
Geldenhuis Est., g.....	"	200,000	1 0	0 10 0	Aug., 1899	5 0 0	6 10 0
Henry Nourse, g.....	"	125,000	1 0	0 10 0	Aug., 1899	8 5 0	8 10 0
Jagersfontein, d.....	Orange Fr. St..	1,000,000	5 0	0 9 0	June, 1899	14 0 0	14 5 0
*Johannesburg Con. Invst	So. Africa.....	2,750,000	1 0	0 2 0	Nov., 1899	1 15 8	1 16 9
Jubilee, g.....	Transvaal	50,000	1 0	0 5 0	Aug., 1899	6 0 0	6 5 0
Langlaagte Estate, g.....	"	500,000	1 0	0 3 0	Sept., 1899	3 0 0	3 10
May Con., g.....	"	275,000	1 0	0 6 0	Aug., 1899	4 11 0	4 12
Meyer & Charlton, g.	"	85,000	1 0	0 8 0	July, 1899	5 7 6	5 12 6
Namaqua, c.....	Cape Colony....	200,000	2 0	0 6 6	June, 1899	4 16 3	4 18
Primrose (New), g.....	Transvaal.....	300,000	1 0	0 6 0	Aug., 1899	4 3 9	4 6
Rand Mines, g.....	So. Africa.....	490,000	1 0	0 5 6	Aug., 1899	41 17 6	42 2
Robinson, g.....	Transvaal	2,750.000	5 0	0 8 0	Aug , 1899	9 0 0	9 5 0
Sheba, g.....	"	1,100,000	1 0	0 0 6	July, 1898	1 1 3	1 3 9
Sim. & Jack Prop., g.....	"	5,000,000	5 0	0 4 0	July, 1899	6 0 0	6 2 6
Wolhuter, g.....	"	880.000	4 0	0 2 0	Feb . 1899	4 7 6	4 12 6

*Ex-dividend.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Val	Dividends. Paid, 1899.	Dividends. Total to Date.	Dividends. Date and Amount of Last.
1	Ætna Cons., q	Cal	$500,000	100,000	$5	$45,000	$195,000	Oct... 1899 .10
2	Alaska-Mexican, g	Alask	1,000,000	200,000	5	72,000	429,031	Oct... 1899 .10
3	Alaska-Treadwell, g	Alask	5,000,000	200,000	25	300,000	4,220,000	Oct... 1899 .37½
4	Alice, g. s	Mont.	10,000,000	400,000	25	.....	1,075,000	April. 1898 .05
5	Amalgamated, c	Mont.	75,000,000	750,000	100	1,500,000	1,500,000	Oct... 1899 2.00
6	American Gold, g. s. c. l.	Colo.	3,000,000	300,000	10	48,000	434,000	June. 1899 .09
7	Amer. Sm & Ref., pref.	U. S.	32,500,000	32,500	100	568,750	568,750	Oct... 1899 1.75
8	Am. Zinc, Lead & Sm	Mo	500,000	200,000	25	40,000	40,000	Oct... 1899 .10
9	Anaconda Copper	Mont.	30,000,000	1,200,000	25	3,900,000	12,150,000	Nov.. 1899 2.00
10	Anchoria-Leland, g	Colo.	600,000	600,000	1	72,000	234,000	Oct... 1899 .08
11	Anglo-Mexican, g	Mex.	2,001,625	400,230	5	.....	1,728,993	Dec.. 1898 .24
12	Apollo Con., g	Cal	1,000,000	100,000	10	40,000	140,000	Jan.. 1899 .40
13	Appie Ellen, g	Colo.	600,000	600,000	1	.....	25,000	Aug.. 1898 .01
14	April Fool	Nev.	500,000	500,000	1	16,000	16,000	Oct... 1899 .01
15	Argonaut	Cal.	2,000,000	200,000	10	220,000	400,000	Nov.. 1899 .10
16	Associated, g	Colo.	1,250,000	1,250,000	1	12,500	84,000	Feb.. 1899 .01
17	Atlantic, c	Mich.	1,000,000	40,000	25	.....	780,000	Feb.. 1898 1.00
18	Aurora, i	Mich.	2,500,000	100,000	25	50,000	890,000	June. 1899 .50
19	Bald Butte	Mont.	250,000	250,000	1	142,500	762,141	Dec.. 1899 .06
20	Big Six, g. s	Colo.	500,000	500,000	1	.....	15,000	May.. 1898 .00½
21	Bonanza	Wash	1,000,000	1,000,000	1	7,500	7,500	Nov.. 1899 .00½
22	Bonanza Dev	N. M.	3,000,000	300,000	10	1,050,000	1,050,000	June. 1899 3.50
23	Boston-Aurora, pref	Mo	800,000	32,000	25	26,640	26,640	Nov.. 1899 .17
24	Boston & California	Cal	600,000	600,000	1	72,000	72,000	June. 1899 .06
25	Boston & Colo. Smelting	Colo.	750,000	15,000	50	45,000	270,000	Oct... 1899 .75
26	Boston-Little Circle, z	Mo-K.	1,000,000	100,000	10	80,000	80,000	Dec.. 1899 .15
27	Boston & Mont. Con	Mont.	3,750,000	150,000	25	5,375,000	14,500,000	Nov.. 1899 15.00
28	Boston, q	Cal	1,000,000	100,000	10	10,000	10,000	Oct... 1899 .10
29	Breece, i	Colo.	5,000,000	200,000	25	40,000	70,000	Dec.. 1899 .05
30	Bullion-Beck & Champ	Utah.	1,000,000	100,000	10	120,000	2,438,400	Dec.. 1899 .10
31	Bunker Hill & Sullivan	Idaho	3,000,000	300,000	10	168,000	768,000	Dec.. 1899 .07
32	Calumet & Hecla, c	Mich.	2,500,000	100,000	25	8,000,000	64,850,000	Sept.. 1899 20.00
33	Cariboo-McKinney, g	B.Col	800,000	800,000	1	72,000	311,965	June. 1899 .01½
34	Centen'l-Eureka, g.s.l.c.	Utah.	5,000,000	200,000	25	120,000	2,150,000	Aug.. 1899 .50
35	Central Lead, l	Mo	1,000,000	10,000	100	60,000	142,000	Dec.. 1899 .50
36	Champion, g. s	Cal	340,000	34,000	10	25,500	321,700	Nov.. 1899 .25
37	Charleston, p. r	S. C.	1,000,000	10,000	100	20,000	200,000	June. 1899 2.00
38	Colorado Smelting	Colo.	1,000,000	100,000	10	100,000	1,945,000	Jan.. 1899 1.00
39	Commodore	Co o.	1,200,000	1,200,000	1	48,000	432,000	Jan.. 1899 .04
40	Commonwealth, z., pref.	Mo	500,000	100,000	5	20,000	20,000	Dec.. 1899 .01
41	Consolidation Coal	Md	10,250,000	102,500	100	205,000	5,716,650	Feb.. 1899 2.00
42	Con. Tiger & Poorman	Idaho	1,000,000	1,000,000	1	.....	20,000	Dec.. 1898 .02
43	Crœsus, g	Cal	1,000,000	200,000	5	.....	30,000	Dec.. 1898 .15
44	Crowned King, g. s. l	Ariz.	6,000,000	600,000	10	.....	232,000	Dec.. 1898 .02
45	Daly	Utah.	3,000,000	150,000	20	.....	2,925,600	Mar.. 1897 .25
46	Daly West	Utah.	3,000,000	150,000	20	60,000	60,000	Nov.. 1899 .20
47	Deadwood-Terra, g	S. D.	5,000,000	200,000	25	.....	1,350,000	May.. 1898 .15
48	Deer Trail No. 2	Wash	1,000,000	1,000,000	1	27,500	45,000	Nov.. 1899 .00½
49	De Lamar, g. s	Idaho	2,000,000	400,000	5	48,000	2,346,000	May.. 1899 .12
50	Della S., g	Colo.	1,000,000	1,000,000	1	.....	60,000	Jan.. 1897 .01
51	Delta Lead & Zinc	Mo	100,000	100,000	1	4,100	4,100	Dec.. 1899 .00½
52	Doe Run, l	Mo	500,000	5,000	100	30,000	90,000	Dec.. 1899 .50
53	Dutch, g	Cal	1,500,000	150,000	10	.....	39,000	Feb.. 1898 .04½
54	Eldorado, g	Cal	1,000,000	100,000	10	10,000	10,000	July.. 1899 .10
55	Elkton Cons., g	Colo.	1,250,000	1,250,000	1	37,500	694,461	Sept.. 1899 .03
56	El Paso, g. s	Colo.	650,000	650,000	1	.....	12,393	Jan.. 1898 .01
57	Empire State-Idaho	Idaho	1,000,000	100,000	10	256,135	323,037	Dec.. 1899 .30
58	Enterprise, s. l	Colo.	500,000	500,000	1	.....	900,000	Sept.. 1898 .05
59	Fanny Rawlings, g. s	Colo.	1,000,000	1,000,000	1	20,000	20,000	Aug.. 1899 .01
60	Fern, g	B.Col	200,000	200,000	1	.....	10,000	Jan.. 1898 .05
61	Ferris-Haggarty, c.g.s.	Wyo.	1,000,000	1,000,000	1	5,000	5,000	Mar.. 1899 .00½
62	Florence, s	Mont.	2,500,000	500,000	5	.....	137,530	Aug.. 1897 .01
63	Garfield Con., g	Colo.	1,200,000	1,200,000	1	12,000	12,000	May.. 1899 .01
64	Geyser-Marion, g	Utah.	1,500,000	300,000	5	.....	96,000	Sept.. 1898 .02
65	Gold Coin of Victor, g	Colo.	1,000,000	1,000,000	1	110,000	260,000	Nov.. 1899 .01
66	Gold & Globe, g	Colo	750,000	750,000	1	.....	51,625	July.. 1898 .00½
67	Gold King, g	Colo.	1,000,000	1,000,000	1	90,000	90,000	Oct... 1899 .03
68	Golden Cycle, g	Colo.	1,000,000	200,000	5	105,000	258,500	Dec.. 1899 .05
69	Golden Eagle, g	Co'o.	500,000	500,000	1	10,000	20,000	Nov.. 1899 .01
70	Golden Fleece, g. s	Colo.	600,000	600,000	1	.....	569,480	Feb.. 1897 .01
71	Golden Reward, g	S. D.	1,000,000	100,000	10	.....	155,000	Feb.. 1898 .15
72	Golden Star, g	B.Col	1,000,000	1,000,000	1	41,000	41,000	July.. 1899 .01
73	Grafton, g	Colo.	1,000,000	1,000,000	1	10,000	10,000	Nov.. 1899 .01
74	Grand Central, g	Utah.	250,000	250,000	1	347,500	666,250	Sept.. 1899 .24
75	Grass Valley Expl	Cal	100,000	30,000	2	30,000	30,000	Oct... 1899 .25
76	Gwin, g	Cal.	1,000,000	20,000	50	59,000	101,500	Dec.. 1899 .25
77	Hall Mines, Ltd	B.Col	1,500,000	300,000	5	.....	160,000	May.. 1898 .25
78	Helena—Frisco, l. s	Idaho	1,100,000	222,000	5	165,000	920,000	Nov.. 1899 .25
79	Holy Terror, g	S. D.	500,000	500 000	1	45,000	162,000	Nov.. 1899 .01
80	Homestake, g	S. D.	21,000,000	210,000	100	857,500	8,038,750	Nov.. 1899 .50
81	Horn-Silver, g. s. c. sp. l.	Utah.	10,000,000	400,000	25	20,000	5,250,000	Mar.. 1899 .05
82	Idaho, s. l	B.Col	$500,000	500,000	$1	$28,000	$292,000	Jan.. 1899 .05½
83	Iowa, g	Colo.	1,000,000	1,000,000	1	.....	95,000	June. 1898 .00½
84	Iron Mountain, g. s. l. i.	Mont.	5,000,000	500,000	10	.....	507,500	April. 1898 .02
85	Isabella, g	Colo.	2,250,000	2,250,000	1	202,500	472,500	Sept.. 1899 .01
86	Jack Pot, g	Colo.	1,250,000	1,250,000	1	75,000	75,000	Sept.. 1899 .04
87	Jamison	Cal	3,900,000	390,000	10	11,700	50,700	April. 1899 .10
88	Klondike Bonanza, Ltd.	Klond	750,000	52,750	5	12,000	12,000	Aug.. 1899 .24
89	Lake Superior Iron	Mich.	2,100,000	84,000	25	84,000	736,000	Feb.. 1899 1.00
90	Last Chance, s. l	B.Col	500,000	500,000	1	25,000	45,000	Apr.. 1899 .05
91	Last Dollar, g	Colo.	1,500,000	1,500,000	1	30,000	30,000	Oct... 1899 .02
92	Le Roi, g	B.Col	5,000,000	200,000	5	240,000	1,305,000	Nov.. 1899 1.20
93	Lillie, g	Colo.	1,250,000	250,000	5	135,000	301,610	Nov.. 1899 .05
94	Little Tiger, g	Cal	500,000	500,000	1	25,000	25,000	Nov.. 1899 .01½
95	Mammoth, g. s. c	Utah.	10,000,000	400,000	25	260,000	1,610,000	Nov.. 1899 .10
96	Marion Con	Colo.	5,000,000	500,000	10	5,000	300,000	May.. 1899 .01
97	Mary McKinney, g	Colo.	1,000,000	1,000,000	1	30,000	30,000	Oct... 1899 .03
98	Matoa, g	Colo.	1,000,000	1,000,000	1	.....	25,000	Dec.. 1898 .02½
99	Mead, g	Cal	200,000	200,000	1	40,000	120,000	June. 1899 .20
100	Mercur, g	Utah.	5,000,000	200,000	25	100,000	1,341,000	Oct... 1899 .25
101	Minnesota Iron	Minn.	16,500,000	165,000	100	.....	4,735,000	Oct... 1898 1.50
102	Missouri Zinc Fields, pf.	Mo	400,000	16,000	25	18,648	18,648	Nov.. 1899 .17
103	Modoc, g	Colo.	500,000	500,000	1	30,000	130,000	Nov.. 1899 .01
104	Montana, Ltd., g. s	Mont.	3,300,000	657,128	5	98,855	453,700	April. 1899 .12
105	Montana Ore Purchas'g	Mont.	2,500,000	80,000	25	560,000	1,360,000	Oct... 1899 1.00
106	Monument, g	Colo.	300,000	300,000	1	.....	12,624	Dec.. 1898 .01
107	Moon-Anchor Con., g	Colo.	1,750,000	600,000	1	45,000	306,000	Nov.. 1899 .07½
108	Morning Star, g	Cal	240,000	2,400	100	63,200	751,800	Oct... 1899 3.00
109	Mt. Rosa, g	Colo.	1,000,000	1,000,000	1	.....	60,000	Jan.. 1898 .02
110	Mt. Shasta	Cal	100,000	20,000	5	6,000	6,000	May.. 1899 .30
111	Moulton	Mont.	2,000,000	400,000	5	40,000	500,000	Oct... 1899 .05
112	Mountain Copper	Cal	6,250,000	250,000	25	1,080,000	1,173,750	Oct... 1899 2.16
113	Napa Cons., q	Cal	700,000	100,000	7	90,000	1,040,000	Oct... 1899 .30
114	New Central Coal	Md	1,000,000	50,000	20	20,000	470,000	April. 1899 .40
115	New Idria, q	Cal	500,000	100,000	5	90,000	170,000	Oct... 1899 .30
116	New York Zinc	Mo	700,000	28,000	25	21,000	21,000	Dec.. 1899 .25
117	N. Y. & Hon Rosario, s. g.	C. A.	1,500,000	150,000	10	150,000	1,130,000	Nov.. 1899 .10
118	North Star Mines of N. J.	Cal	5,000,000	250,000	10	50,000	50,000	Nov.. 1899 .20
119	Nugget	Colo.	1,000,000	1,000,000	1	.....	20,000	Aug.. 1898 .00½
120	Okanogan, g	Wash	62,500	1,250,000	05	3,125	3,125	Oct... 1899 .00½
121	Ontario, s. l	Utah.	1,500,000	150,000	100	.....	13,557,500	Nov.. 1897 .75
122	Orphan Bell, g	Colo.	1,000,000	1,000,000	1	.....	115,000	Mar.. 1898 .01
123	Original Empire, g	Cal	5,000,000	50,000	100	100,000	500,000	May.. 1899 1.00
124	Osceola, c	Mich.	2,500,000	93,000	25	558,000	3,080,500	Dec.. 1899 3.00
125	Parrot, c	Mont.	2,300,000	230,000	10	897,000	3,035,898	Oct... 1899 1.50
126	Pennsylvania Coal	Pa	5,000,000	190,000	50	800,000	4,050,000	May.. 1899 8.00
127	Pennsylvania Cons	Cal	5,150,000	51,500	100	68,250	136,475	Dec.. 1899 .20
128	Petro, g	Utah.	1,000,000	200,000	5	15,000	32,000	Oct... 1899 .02½
129	Pioneer, g	Cal	1,000,000	100,000	10	12,500	62,500	Mar.. 1899 .12½
130	Portland, g	Colo.	3,000,000	3,000,000	1	600,000	2,437,080	Nov.. 1899 .02
131	Queen Bess Propr., s. l.	B.Col	500,000	100,000	5	25,000	25,000	July.. 1899 .12½
132	Quicksilver, pref	Cal	4,300,000	43,000	100	21,500	1,845,411	May.. 1899 .50
133	Quincy, c	Mich.	2,500,000	100,000	25	950,000	11,070,000	Aug.. 1899 6.00
134	Rambler—Cariboo, s. l.	B.Col	1,000,000	1,000,000	1	20,000	60,000	Dec.. 1899 .01
135	Raven, g	Colo.	1,500,000	1,500,000	1	30,000	49,500	Nov.. 1899 .01
136	Reco, s. l	B.Col	1,000,000	1,000,000	1	.....	297,500	Jan.. 1898 .10
137	Republic Cons., g	Wash	3,500,000	3,150,000	1	157,500	277,500	Sept.. 1899 .01
138	Royal Con	B.Col	2,500,000	2,500,000	1	50,000	1,050,000	June. 1899 .01
139	Sacramento, g	Utah.	5,000,000	1,000,000	5	50,000	138,000	Oct... 1899 .00½
140	St. Joseph, l	Mo	3,000,000	300,000	10	112,500	2,897,000	Sept.. 1899 .50
141	Seventy-Six, g. s	Colo.	1,000,000	200,000	5	.....	2,950	Mar.. 1898 .02
142	Santa Rosalia, g.s	Cal	100,000	100,000	1	5,000	130,000	Oct... 1899 .05
143	Silver King, g. s. l	Utah.	3,000,000	150,000	20	575,000	2,400,000	Dec.. 1899 .34
144	Small Hopes, s	Colo.	5,000 000	250,000	20	25,000	3,325,000	Feb.. 1899 .10
145	Smuggler, s. l. z	Colo.	1,000,000	1,000,000	1	125,000	1,220,000	Dec.. 1899 .01
146	South Swansea, s. l	Utah.	150,000	150,000	1	52,500	165,000	Dec.. 1899 .05
147	Squaw Mountain, g	Colo.	2,000,000	2,000,000	1	10,000	10,000	Nov.. 1899 .00½
148	Standard Cons., g. s	Cal	2,000,000	200,000	10	60,000	3,893,226	Nov.. 1899 .10
149	Standard	Idaho	500,000	500,000	1	30,000	1,745,000	April. 1899 .06
150	Stratton's Independ'ce	Colo.	5,500,000	1,100,000	5	488,000	488,000	Sept.. 1899 .48
151	Swansea, s. l	Utah.	500,000	100,000	5	60,000	251,000	Nov.. 1899 .05
152	Tamarack, c	Mich.	1,500,000	60,000	25	600,000	6,270,000	Dec.. 1899 6.00
153	Tomboy, g	Colo.	1,500,000	300,000	5	152,000	812,000	Dec.. 1899 .24
154	United, z. l., pref	Mo	1,000,000	40,000	25	40,000	40,000	July.. 1899 .50
155	Utah	Utah.	1,000,000	100,000	10	2,000	179,000	Jan.. 1899 .02
156	Victor, g	Colo.	1,000,000	200,000	5	.....	1,155,000	Dec.. 1898 .50
157	Vindicator, Cons., g	Colo.	1,500,000	1,015,000	1	177,625	304,500	Oct... 1899 .05
158	War Eagle, Cons	B.C.	2,000,000	1,750,000	1	315,000	492,750	Dec.. 1899 .01½
159	West. Mine Enterprise	Mont.	500,000	120,000	1	.....	48,680	Jan.. 1898 .20
160	Wolverine, c	Mich.	1,500,000	60,000	25	210,000	270,000	Oct... 1899 1.50
161	Yellow Aster, g	Cal	1,000,000	100,000	10	115,000	283,789	Dec.. 1899 .10

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Val	Assessments. Levied 1899.	Assessments. Total to Date.	Assessments. Date and Amount of Last.
1	Alaska	Utah.	$1,000,000	1,000,000	$1	$50,000	$50,000	Sept.. 1899 .01½
2	Arnold, c	Mich.	1,500,000	60,000	25	180,000	180,000	Jan.. 1899 3.00
3	Best & Belcher, g. s.	Nev.	302,400	100,800	3	40,320	2,631,403	Oct... 1899 .20
4	Bingham Placer	Utah.	275,000	275,000	1	27,500	27,500	Oct... 1899 .10
5	Boston & Cp. Ck., g	Colo.	400,000	200,000	2	.....	20,000	Aug.. 1898 .10
6	California Borax	Cal.	200,000	2,000	100	4,000	4,000	Oct... 1899 2.00
7	Centennial, c	Mich.	2,500,000	100,000	25	.....	460,000	Mar.. 1898 3.00
8	Central Eureka, g	Cal.	4,000,000	400,000	10	34,000	135,942	Sept.. 1899 .03
9	Chollar, g. s	Nev.	336,000	112,000	3	28,000	2,075,000	Aug.. 1899 .15
10	Con. Cal. & Va	Nev.	540,000	216,000	2½	108,000	786,000	Oct... 1899 .25
11	Cons. Imperial, g. s	Nev.	500,000	500,000	1	10,000	2,256,000	Nov.. 1899 .01
12	Crown Point, g. s	Nev.	300,000	100,000	3	20,000	2,990,000	Nov.. 1899 .10
13	Dalton, s. l	Utah.	2,500,000	500,000	5	5,000	58,750	April. 1899 .01
14	Dexter	Nev.	1,000,000	200,000	5	.....	38,000	Apr.. 1898 .15
15	Diamond Con	Utah.	1,000,000	200,000	5	8,000	8,000	Mar.. 1899 .04
16	Eureka Con. Drift. g	Cal.	500,000	500,000	1	12,500	183,000	Nov.. 1899 .00½
17	Geyser, s. l	Colo.	5,000,000	500,000	10	150,000	1,225,000	July.. 1899 .10
18	Gold Coin	Colo.	1,000,000	200,000	5	10,000	10,000	Mar.. 1899 .05
19	Gould & Curry	Nev.	324,000	108,000	3	27,000	4,646,050	Oct... 1899 .15
20	Granite Hill, g. s	Cal.	500,000	100,000	5	3,000	124,000	June. 1899 .03
21	Great Western, q	Cal.	5,000,000	50,000	100	20,000	75,520	May.. 1899 .15
22	Hale & Norcross, g.s	Nev.	336,000	112,000	3	39,200	39,200	Nov.. 1899 .10
23	Head Center Con., s.g	Ariz.	5,000,000	200,000	25	25,125	25,125	Mar.. 1899 .10
24	Horse Shoe Bar Cons	Cal.	6,000,000	60,000	100	3,000	85,800	Jan.. 1899 .05
25	Little Pittsburg	Utah.	2,000,000	400,000	5	3,000	21,000	June. 1899 .00¾
26	Lower Mammoth	Utah.	150,000	150,000	1	7,500	22,500	June. 1899 .05
27	Lucky Bill	Utah.	300,000	120,000	2½	2,500	58,800	Nov.. 1899 .02
28	Marguerite, g	Cal.	500,000	50,000	10	15,000	85,000	Aug.. 1899 .10
29	Marina Marsicano, g	Cal.	$1,000,000	100,000	$10	$19,000	$54,360	Oct... 1899 .05
30	Martin & White	Nev.	1,000,000	100,000	10	150,000	150,000	Dec.. 1899 1.50
31	Mayday, g. s	Cal	50,000	50,000	1	5,000	10,000	July.. 1899 .10
32	Mayflower, g	Cal.	1,200,000	60,000	20	.....	6,000	Sept.. 1898 .05
33	Meteor, s. l	Utah.	600,000	300,000	2	6,000	9,734	Sept.. 1899 .01
34	Mexican, g. s	Nev.	302,400	100,809	3	25,200	2,283,920	Nov.. 1899 .15
35	Montreal	Utah.	2,500,000	250,000	10	25,000	30,625	April. 1899 .05
36	Northern Light, g	Utah.	2,000,000	400,000	5	.....	80,000	July.. 1898 .10
37	Ophir, g. s	Nev.	302,400	100,800	3	50,400	4,652,968	Nov.. 1899 .20
38	Osceola, g	Cal.	10,000,000	100,000	100	1,000	11,810	Oct... 1899 .01
39	Potosi, g. s	Nev.	336,000	112,000	3	28,000	2,185,200	Sept.. 1899 .15
40	Powning	Cal.	750,000	75,000	10	2,800	2,800	Aug.. 1899 .01
41	Rescue, g	Nev.	100,000	10,000	10	500	5,500	Feb.. 1899 .05
42	Reward, g	Cal.	64,000	64,000	1	1,400	65,280	Nov.. 1899 .02½
43	Revenue	Utah.	150,000	150,000	1	4,500	4,500	Nov.. 1899 .02
44	Salmon River, c. s. g	Nev.	57,000	57,000	1	1,425	11,970	Oct... 1899 .02½
45	Savage, g. s	Nev.	280,000	112,000	2½	22,400	7,309,800	Sept.. 1899 .10
46	Shower Con	Utah.	2,000,000	400,000	5	8,000	8,000	Aug.. 1899 .02
47	Sierra-Nevada, g. s	Nev.	300,000	100,000	3	50,000	6,756,910	Dec.. 1899 .15
48	Silver King, s	Ariz.	10,000,000	100,000	100	50,000	490,000	Aug.. 1899 .25
49	Snow Flake	Utah.	500,000	100,000	5	5,000	51,000	July.. 1899 .02
50	Sunbeam Cons	Utah.	250,000	250,000	1	50,000	73,125	Oct... 1899 .10
51	Tetro	Utah.	300,000	300,000	1	15,000	33,000	Nov.. 1899 .01
52	Union Cons., g. s	Nev.	250,000	100,000	2½	18,000	2,620,000	Sept.. 1899 .15
53	Utah Cons, s	Nev.	100,000	100,000	1	15,000	485,000	Sept.. 1899 .05
54	Valeo	Utah.	200,000	200,000	1	10,000	10,000	May.. 1899 .05
55	Watt Blue Gravel, g	Cal.	1,100,000	100,000	10	3,000	58,000	May.. 1899 .03
56	Yellow Jacket, g.s	Nev.	360,000	120,000	3	18,000	5,306,000	April. 1899 .15

G., Gold. S., Silver. L., Lead. C., Copper. Z., Zinc. This table is corrected up to Dec. 1. Correspondents are requested to forward changes or additions.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

	Cust. Meas.	Price.
Abrasives—		
Carborundum, f.o.b.		
Niagara Falls grains..	lb.	$0.10
Powd., F. FF. FFF..	"	.08
Minute No. 1.....	"	.15
No. 15.....	"	1.00
Corundum, N. C.....	"	.07@.10
Chester.....	"	.04½@.05
Emery, Turkish flour...	"	.03
Grains.....	"	.05
Naxos flour.....	"	.03
Grains.....	"	.05
Chester flour.....	"	.03
Grains.....	"	.05
Peekskill flour.....	"	.01¾
Grains.....	"	.02½
Crude, Kuluk, best...lg. ton		18.50
Levant, " ...		22.00
Naxos (Greek) best "		26.00
Pumice Stone, Am. powd.	lb.	.01@.02
Italian, powdered....	"	.01½
Lump, per quality....	"	.04@.40
Rottenstone, ground....	"	.02½@.03
Lump, per quality....	"	.05@.14
Rouge.....	"	.17@.30
Tripoli, prepared.....sh. ton.		20.00
Acids—Acetic, 30% pure.100 lbs.		2.75@4.00
30% ch. pure.....	"	6.00@8.00
80% pure.....	"	7.50@9.50
Benzoic, English.....	oz.	.09@.09½
German.....	lb.	.46@.47
Boracic, pure cryst.....	"	.11
Powdered	"	.11½@.11¾
Carbolic, cryst. in drums	"	.16
Carbonic, liquid.....	"	.15
Chromic, crude.....	"	.23
Chem. pure.....	"	.50
Absol. ch. pure.....	"	1.75
Hydrochloric, ch. pure.	"	.08
Hydrofluoric, 30%.....	"	.03@.04½
48%.....	"	.05@.06
Best.....		.25
Nitric, chem. pure.....	"	.10
Sulphuric, 98%.....	"	.02
Chem. pure.....	"	.07
Tartaric, cryst.....	"	.32
Powder.....	"	.32½
Alcohol—Grain.....	gal.	2.42@2.44
Refined wood, 95@97%	"	.80@.85
Purified.....	"	1.20@1.55
Alum—Lump.....100 lbs.		1.75
Ground...	"	1.85
Chrome, com'l.....	"	3.50
Aluminum—		
Nitrate.....	lb.	1.50
Oxide, com'l, common..	"	.06½
Best.....	"	.20
Pure.....	"	.80
Hydrated.....	"	.05
Sulphate, pure..	"	.02
Com'l.....	"	1.50
Ammonia—Aqua, 16° ..	"	.04
18°	"	.04½@.05½
20°	"	.05@.06
26°	"	.07@.08
Ammonium—Bromide, p'r'	"	.52@.53
Carbonate lumps.....	"	.08¼@.08¾
Powdered.....	"	.09¼@.09¾
Muriate, gran., white...	"	.06¾
Gran. ch. p.....	"	.09½
Lump.....	"	.09½
Gray.....	"	.06¼
Nitrate, white, pure (99%)	"	.10½
Phosphate, com'l.....	"	.12@.15
Chem. pure..	"	.60
Antimony—Glass	"	.30@.40
Needle, lump.....	"	.05½@.06
Powdered, ordinary..	"	.05¾
Best.....	"	.08½
Oxide, com'l white, 95%.	"	.09½
Com'l white, 99%.....	"	.10½
Com'l gray.....	"	.07@.08
Sulphuret, com'l.....	"	.16
Arsenic—White	"	.04¾@.05¼
Red	"	.07¾@.08½
Asphaltum—		
Ventura, Cal.....sh. ton		32.00
Cuban, refined.....	lb.	.04½
Common.....	"	.02
Egyptian, refined.....	"	.06½
Trinidad, refined.....	"	.01½
San Valentino .....lg. ton		15.00
Gilsonite, Utah, ordinary	lb.	.03¼
Select.....	"	.03¾
Barium—Carbonate,		
Lump, 80@90% ....sh. ton		25.00@27.50
92@98%.....	"	26.00@29.00
Powdered, 80@90%...	lb.	.01¾@.02
Chloride, com'l.....	"	.02¼
Chem. pure cryst	"	.05
Nitrate, powdered	"	.05¾
Oxide, com'l, hyd. cryst	"	.18@.22
Hydrated, pure cryst.	"	.25
Pure, powd.....	"	.27
Sulphate.....	"	.01
Barytes—Crude, No. 1..sh. ton		9.00@10.00
No. 2.....	"	8.00@8.25
No. 3.....	"	7.75@8.00
Prime White.....	"	18.00@20.00
Floated.....	"	19.00@20.00
Bauxite—Ga. & Ala. f.o.b. cars, first grade.....lg. ton		5.00
Second grade.....	"	3.75
Benzole—90%..... gal.		1.00@1.10
Bismuth—Oxide, hydr.. lb		2.25@2.56
Subnitrate cryst.....	oz.	.09@.10
Bitumen, "B".....	lb.	.03½
"A".....	"	.05
Bone Ash.....	"	02¾@.03½
Borax—Cryst. and pow'd	"	.07@.07¼
Calcined	"	.22
Bromine—Bulk.....	"	.45
Cadmium—Metallic.....	"	1.50@2.00
Sulphide.....	"	2.00@3.00
Sulphate.....	"	2.00@2.50
Carbide, in ton lots, f. o. b. Niagara Falls, N.Y.	lb.	.03@.04

	Cust. Meas.	Price.
Calcium—		
Acetate, pure white.....100 lbs.		$1.00
Gray.....	"	1.35@1.40
Brown	"	.90@.95
Carbonate, ppt.....	lb.	.05
Chloride, com'l.....100 lbs.		.95
Best	"	1.90
Sulphite.....	lb.	.05
Cement—		
Portland, Am., 400 lbs..	bbl.	1.50@2.00
Foreign.....	"	1.75@2.50
"Rosendale," 300 lbs...	"	.90
Sand cement, 400 lbs...	"	1.55@1.95
Slag cement, imported.	"	1.65
Ceresine—		
Orange and Yellow.....	lb.	.11
White.....	"	.13
Chalk—Lump, bulk.....sh. ton		2.15@2.25
Precipitated.....	lb.	.04@.04½
French..... .....100 lbs.		.30@.35
Chlorine—Liquid.....	lb.	.30
Water.....	"	.15
Chrome Ore—		
(50% chrome) ex-ship....lg. ton		20.00@21.00
Sand.....	"	35.00
Clay, China—Am. com., ex-dock, N. Y.....lg ton		7.70
Am. best, ex-dock, N. Y.	"	8.70
English, common.....	"	11.00
Best grade.....	"	16.00
Fire, ground, f.o.b. Jersey City, N. J.....sh. ton		4.00@5.00
Slip Clay.....	"	6.00
Cobalt—Carbonate.....	lb.	1.50
Nitrate	"	1.30
Oxide—Black.....	"	2.00
Gray.....	"	2.50
Smalt, blue ordinary	"	.20
Best.....	"	.30
Chem. pure.....	"	5.00
Copperas.....100 lbs.		.62½
Copper—		
Carbonate.....	lb.	.18@.20
Chloride.....	"	.25
Nitrate, crystals.....	"	.35
Oxide.....	"	.19@.20
Cream of Tarter—crys.	"	.23½
Granulated.....	"	.24
Powdered	"	.24
Cryolite.....	"	.06½
Explosives—		
Blasting powder, A.....	"	.10@
Blasting powder, B.....	"	-05@.05@
"Rackarock," A.....	"	.25
"Rackarock," B.....	"	.18
Judson R.R. powder....	"	.10
Dynamite, (40% nitro-glycerine).....	"	.15
(50% nitro-glycerine)..	"	.17
(60% nitro-glycerine)..	"	.19
(75% nitro-glycerine)..	"	.23
Glycerine for nitro (32 2-10° Be.).....	"	.16½
Nitro-Benzole.....	"	.14
Feldspar—Ground.....sh. ton		6.50@7.75
Flint—(See Silica).		
Fluorspar, f. o. b. mines—		
Am. lump, 1st grade...	"	7.50
2d gr	"	6.50
Gravel.....	"	6.00
Crushed.....	"	5.75
Ground, ex. fine	"	19.00
2d gr.....	"	15.00
Foreign, lump.....	"	8.00@12.00
Ground.....	"	11.50@14.00
Fuller's Earth—Lump.100 lbs.		.75
Powdered.....	"	.85
Ganister Rock.....lg. ton.		6.50
Graphite—(See Plumbago).		
Gypsum—		
Am. gr'd (terra alba)...sh. ton		8.00
Fertilizer.....	"	7.00
Rock.....	lg. ton	4.00
English and French.....	"	14.00@16.00
Infusorial Earth—Ground.		
American, best.....	"	20.00
French.....	"	37.50
German.....	"	40.00
Iodine—Crude.....100 lbs.		2.45
Resublimed.....	"	2.85
Iron—Chromate.....	lb.	.03@.10
Muriate	"	.05
Nitrate, com'l.....	"	.01¼@.01¾
True.....	"	.04
Oxide, pure copperas col	"	.05@.10
Purple-brown.....	"	.02
Veneian red.....	"	01@.01½
Scale	"	.01@.03
Kaolin—(See Clay, China).		
Kryolith—(See Cryolite.)		
Lead—Acetate, white ...	lb.	.06½@.07½
Com'l, broken.....	"	.06@.07
White, gran.....	"	.07½@.08
Nitrate, com'l.....	"	.00½@.06¾
Chem. pure.....		.35
Lime—Bldg., ab. 250 lbs	bbl.	.90
Finishing.....	"	1.00
Magnesite—		
Crude, lump (95%) Greece	lg. ton	7.25
German (85%).....	"	12.00
Calcined, 600° C. (Greece)	"	15.00
1,000° C. (Greece)	"	18.50
3,000° F. (Greece)..	"	21.00
Domestic, soft.....sh. ton		12.00@15.00
Bricks, all magnesite..	M.	185 00
Magnesite and chrome.	"	226.00
Magnesium—		
Metallic, ingots (Ger)..	kg.	5.95@6.90
Powdered (Ger.).....	"	6.19
Ribbon or wire (Ger.).	"	10.00
Carbonate, light, fine pd	lb.	.03¾@.04
Blocks.....	"	06@.09
Chloride, com'l.... ...	"	013¾
Fused.....		.20
Nitrate.....	"	60
Manganese—Crude, pow'd 70@75% binoxide....	"	.01¾@.01½

	Cust. Meas.	Price.
Manganese—		
75@85% binoxide....	lb.	.01½@.02½
85@90% binoxide....	"	.02½@.03¼
90@95% binoxide....	"	.03¾@.05½
Carbonate.....	"	.16@.20
Chloride.....	"	.04
Ore, 50%.....	unit	.22@.22½
Marble—Flour .....sh. ton		5.50@8.00
Mercury—		
Bichloride	lb.	.59@.60
Bisulphate.....	"	.41
Mica—N. Y. gr'nd, coarse	"	.05
Fine.....	"	.08
Sheets, 1½x3 in.....	"	.60
8x10 in.....	"	13.00
Mineral Wool—		
Slag, ordinary.....100 lbs.		.90
Selected.....	"	1.40
Extra	"	3.00
Rock, ordinary.....sh. ton		32.00
Selected.....100 lbs.		2.50
Extra	"	5.00
Monazite—92%.....sh. ton		140.00
Nickel—Oxide, bl'k No. 1	lb.	1.00
Black No. 2.....	"	.60
Green, No. 1.....	"	1.00
No. 2.....	"	.60
Oils—		
Black, reduced 29 gr.:		
25@30 cold test.....	gal.	.10½@.11
15, cold test.....	"	.11½@.12
Zero.....	"	.12½@.13½
Summer.....	"	.10@.10½
Cylinder, dark steam ref	"	.09½@.14½
Dark filtered.....	"	.12½@.17½
Light filtered.....	"	.14½@.17
Extra cold test.....	"	.22½@.26½
Gasolene, 86° @90°.....	"	.16@.18
Neutral filtered, lemon, 33@34 gr.....	"	.14½@.20
White, 33@34 gr.....	"	.22½@.24½
Wool grade, 32 gr....	"	.12½@.15½
Naphtha, 62°.....	"	.12¾
Deodorized, 76°.....	"	.13¾
Linseed, domestic raw..	"	.44
Boiled	"	.46
Calcutta, raw.....	"	.65
Graphite, lubricating, Am. dry.....	lb.	.10
In oil.....	"	.12
Axle grease.....	"	.08½@.10
Wood grease.....	"	.05@.06
Ozokerite—Foreign	"	.08
Paints and Colors—		
Benzine, Sumatra.....	"	.35@.40
Marbled.....	"	.27@.28
Chrome green, common	"	.05@.06
Extra.....	"	.12@.15
Chem. pure.....	"	.19@.25
Yellow, common.....	"	.10
Best.....	"	.25
Silica Graphite, thick..	"	.12
Thinned.....	gal.	1.15
Lampblack—Com'l.....	lb.	.03@.05
Refined.....	"	.08@.10
Calcined.....	"	.12@.20
Fine spirit.....	"	.20@.35
Litharge, Am. powd..	"	.06@.06½
English flake.....	"	.08@.08½
Metallic, brown.....sh. ton		16.00@20.00
Red.....	"	16.00@20.00
Ocher, Am. common....	"	9.25@10.00
Best.....	"	21.25@25.00
Dutch, washed.....	lb.	.04¾@.05
French, washed.....	"	.01¼@.02½
Orange mineral, Am...	"	.07¾@.08
Foreign, as to make..	"	.09@.10¾
Paris green, pure.....	"	.11@.12
Red lead, American.....	"	.06@.06½
Foreign.....	"	.08@.08½
Shellac, "D. C.".....	"	.26
Native.....	"	16
Turpentine, spirits.....	gal.	.44½@.45
Ultramarine, best.....	lb.	.25
Vermilion, Amer. lead..	"	.10
Quicksilver.....	"	.64@.65
Chinese	"	.80@.90
English, imported....	"	.67
White lead, Am., dry...	"	.05½@.05¾
In oil.....	"	.06@.06½
English, in oil.....	"	.07½@.08½
Whiting, common.....100 lbs.		.45
Gilders.....	"	.50
Zinc white, Am., ex. dry	lb.	.05¾@.06
American, red seal...	"	.07½@.08
Green seal.....	"	.08@.08½
Foreign, red seal, dry	"	.07¾@.08¾
Green seal, dry.....	"	.08¾@.09¾
Foreign, in oil.....	"	.10½@.11¾
Plumbago—		
Am. lump, f. o. b. Providence, R. I.....sh. ton		8.00
Am. pulv., f. o. b. Providence, R. I.....	"	30.00
German, lump.....100 lbs.		1.50
Pulverized.....	"	2.00
Ceylon, pulv. common.	lb	.04½
Best.....	"	.06@.10
Italian, pulv.....	"	.01¾
Potash—Caustic, ord...	"	.05
Elect. (90%).....	"	.06@.07
Potassium—		
Metallic, in balls (Ger)..	kg.	17.85
Bicarbonate cryst.....	lb.	.08½
Powdered or gran.....	"	.12
Bichromate.....	"	.09¾
Bromide, ...	"	.46@.47
Carbonate.....	"	.02¾@.03¼
Chromate	"	.35
Cyanide (98@99%).....	"	.28@.29
Ferro-cyanide	"	.19@.20
Iodide	"	2.15
Permanganate, pure cr.	"	.14@.15
Prussiate, yellow.	"	.19¼@.19½
Red.....	"	.37@.38
Silicate.....	"	.06
Sulphide, com'l.....	"	.10

	Cust. Meas.	Price.
Quartz—(See Silica).		
Rosin—Common.....	bbl.	$1.25
Best.....	"	4.10
Salt—N.Y. com. fine abt. 380 lbs.....	bbl.	.70
N. Y. agricultural.....sh. ton		1.50
N, Y. coarse.....	"	2.30
N. Y. dairy and table...	"	2.90
Saltpeter—Crude.....100 lbs.		3.50
Refined.....	"	4.25@5.50
Samarskite.....	lb.	1.00
Silica—Best foreign....lg. ton		10.00@11.00
Ground quartz, ord....sh. ton		6.00@8.00
Best.....	"	12.00
Lump quartz.....	"	2.50@4.00
Fire bricks (Blue Welch) M.		35.00
Silver—Chloride.....	oz.	.65
Nitrate.....	"	.41
Oxide.....	"	.85@1.10
Sodium—Metallic.....	lb.	.07¾
Acetate, com'l.....	"	.03¾@.04
Bichromate.....	"	.07
Bromide	"	.49@.50
Chlorate, com'l.....	"	.09¾@.10
Hyposulphite.....100 lbs.		1.60@1.70
Nitrite.....	lb.	.07½@.07¾
Peroxide.....	"	.45
Phosphate.....	"	.03
Triphosphate	"	.04
Silicate, conc.....	"	.01@.01½
Sulphate, gran., purl'd..	"	.03
Sulphide.....100 lbs.		1.75
Sulphite.....	lb.	.02½
Tungstate, com'l.	"	.35
Pure.....	"	.50
Strontium—Nitrate	"	.07½
Sulphur—Roll.....100 lbs.		1.70
Flour.....	"	1.80@1.85
Flowers, sublimed...	"	2.00
Talc—N. C. No. 1.....sh. ton		15.00@15.50
No. 2.....	"	10.00@12.00
N. Y., Fibrous.....	"	8.00@9.00
French. .....100 lbs.		1.25@1.50
Italian.....	"	1.50@2.00
Tar—Coal.....	bbl.	3.00
Tin—Chloride	lb.	.13@.15
Crystals.....	"	.24@.26
Muriate, com'l.	"	.09
Oxide, white, ch. pure..	"	.48@.50
Uranium—Oxide.....	"	1.80@3.00
Zinc—Metallic, ch. pure..	"	.09@.10
Carbonate.....	"	.15
Chloride	"	.06@.08
Dust.....	"	.07@.07¼
Sulphate.....	"	.02½

THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

	Cust. Meas.	Price.
Barium—Amalgam.....	grm.	$1.19
Electrol.....	"	5 71
Beryllium—Powder.....	"	5.95
Crystals.....	"	9.04
Nitrate (N Y.).....	oz.	2.50
Boron—Amorphous, pure	grm.	.19
Crystals, pure.....	"	1.43
Nitrate (N. Y.).....	lb.	1.50
Calcium—Electrol.....	"	4.28
Cerium—Fused.....grm.		2.02
Nitrate (N. Y.).....	lb.	21.00
Chromium—Fused.....	kg.	5.95
Pure powder 95%.....	"	1.79
Chem. pure cryst.....	grm.	.21
Cobalt—(98@99%).....	kg.	5.35@5.71
Pure.....	"	30.94
Didymium—Powder....	grm.	3.81
Nitrate (N. Y.).....	oz.	4.00
Erbium	grm.	3.09
Nitrate (N. Y.).....	oz.	3.00
Gallium	grain	9 52
Germanium—Powder....	grm.	33.32
Fused.....	"	35.70
Glucinum—Powder.....	"	5.95
Crystals.....	"	9.04
Nitrate (N. Y.).....	oz.	2.50
Indium.....	grm.	4.05
Iridium—.....	"	2.38
Lanthanum—Powder....	"	4.28
Electrol, in balls	"	9.04
Nitrate (N. Y.).....	oz.	3.50
Lithium.....	grm.	2.38
Nitrate (N. Y.).....	oz.	.60
Molybdenum—Powder...	kg.	2.62
Fused, electrol 95%.....100 grms.		15.47
Niobium.....	grm.	3.81
Osmium.....	"	.95
Palladium.....	"	.95
Rhodium.....	"	2.87
Rubidium—Pure.....	"	4.76
Ruthenium—Pure powd	"	2.38
Selenium—Com'l powder	kg	30.94
Sublimed powder.....	"	40.46
Sticks.....	"	33.32
Silicium—Amorphous...100 grms.		2.87
Crystals, pure....	"	5.95
Strontium—Electrol	grm.	6.19
Tantalium—Pure.....	"	3.57
Tellurium—Ch. p. sticks.100 grms.		11.90
Powder.....		9.52
Thallium	kg.	23.80
Thorium—Metallic.....grm.		7.85
Nitrate 49@50% (N. Y.)..	lb.	5.00@5.50
Titanium	grm.	.71
Uranium	"	.48
Nitrate (N. Y.).....	oz.	.25
Vanadium—Fused.....grm.		1.19
Wolfram—Fused.....100 grms.		22.80
Powder, 95@98%.....	kg.	1.90
Chem. pure.....	"	6.42
Yttrium.....	grm.	3.33
Nitrate (N. Y.).....	oz.	4.00
Zirconium—Com'l.....	kg.	119.00
Pure.....	grm.	.71
Nitrate (N. Y.).....	oz.	1.00

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to Oct. 28th. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Review of Chemicals and Minerals.